

**ARMY TM 9-6115-752-24&P  
AIR FORCE TO 35C2-3-534-2  
MARINE CORPS TM 09246C/11776A-OI/1  
NAVY TM 7610-LL-L1A-0028**

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**TECHNICAL MANUAL**

**FIELD AND SUSTAINMENT MAINTENANCE MANUAL  
INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST**

**FOR**

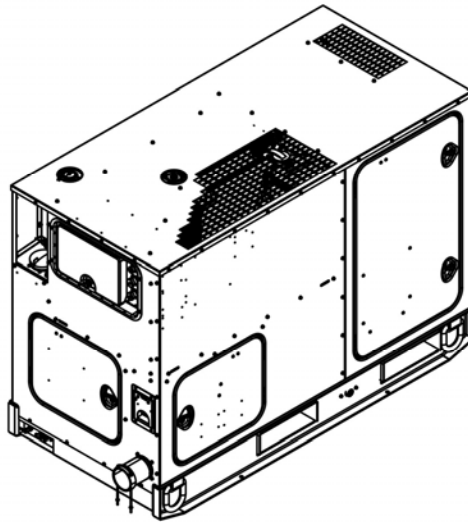
**GENERATOR SET, SKID MOUNTED  
30KW ADVANCED MEDIUM MOBILE POWER SOURCES  
(AMMPS)**

**MEP-1060, 50/60 Hz**

**(NSN: 6115-01-561-7718) (EIC: MA7)**

**MEP-1061, 400 Hz**

**(NSN: 6115-01-561-7738) EIC: MA8)**



**\*SUPERSEDURE NOTICE** – This manual supersedes TM 9-6115-752-24&P, TO 35C2-3-534-2, TM 09246c/11776A-OI/1, and TM 7610-LL-L1A-0028 dated 1 June 2011. Date of issue for the revised manual is 30 November 2011.

**DISTRIBUTION STATEMENT A** — Approved for public release; distribution is unlimited.

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**HEADQUARTERS, DEPARTMENT OF THE ARMY,  
AIR FORCE, NAVY, AND  
HEADQUARTERS, U.S. MARINE CORPS  
31 DECEMBER 2011**

**PCN 184 092463 00**





## WARNING SUMMARY

### FIRST AID

For First Aid information, refer to Field Manual (FM) 4-25.11.



**5**

#### 5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK:

**1**

Do not try to pull or grab the individual.

**2**

If possible, turn off the electrical power.

**3**

If you cannot turn off the electrical power, pull, push, or lift the person to safety using a dry wooden pole, dry rope, or some other insulating material.

**4**

Send for help as soon as possible.

**5**

After the injured person is free of contact with the source of electrical shock, move the person a short distance away. Immediately start artificial respiration if necessary.

The Warning Summary summarizes critical safety and hazardous material warnings that must be understood and applied during operation and maintenance of the Advanced Medium Mobile Power Sources (AMMPS) generator sets.

- These warnings are important.
- Study and understand all warnings.
- These warnings can save your life and the lives of personnel with whom you work.
- Some general warnings found in the Warning Summary will not be repeated within the Technical Manual (TM).
- Specific warnings will be listed above the task or paragraph to which they apply.

Operation and maintenance of the AMMPS generator set contains many possibilities for injury or death to personnel. Be sure to be familiar with general first aid procedures as referenced in FM 4-25.11, First Aid.

## WARNING ICONS

The following icons are used in conjunction with warnings so that you do not miss important information. They are not meant to be a substitute for reading the warnings, but they provide graphic description of the danger.



EAR PROTECTION — Headphones over ears shows that noise level will harm ears.



ELECTRICAL — Electrical wire to arm with electricity symbol running through human body shows that life-threatening shock hazard is present.



ELECTRICAL — Electrical wire to hand with electricity symbol running through hand shows that shock hazard is present.



FLYING PARTICLES — Objects striking person shows that the material presents a danger to life or health.



HEAVY OBJECT — Human figure stooping over heavy object shows physical injury potential from improper lifting technique.



HEAVY PARTS — Heavy object on human figure shows that heavy parts present a danger to life or limb.



HIGH PRESSURE — Human hand being penetrated by high pressure shows system pressures present a danger to life or limb.



HOT AREA — Hand over object radiating heat shows that equipment is hot and can burn.



MOVING PARTS — Human figure with an arm caught between the gears shows that the larger moving parts of the equipment present a danger to life or limb.



MOVING PARTS — Hand with fingers caught between gears shows that the smaller moving parts of the equipment present a danger to life or limb.



SHARP OBJECT — Human hand being punctured shows equipment presents a danger to life or limb.

## WARNING DESCRIPTIONS

### WARNING



#### Electrical

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- High voltage is produced when this generator set is in operation. Do not contact output cables when operating this generator set. Failure to comply may cause injury or death to personnel.
- High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that personnel working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.

## WARNING



### Electrical — Continued.

- High voltages may be present at the generator terminals when unit is rotating. Tools, equipment, clothing, and your body must be kept clear of rotating parts and electrical connections. Special precautions must be taken during troubleshooting because protective covers and safety devices may be removed or disabled to gain access and perform tests. Use extreme caution. Failure to comply may cause injury or death to personnel by electrocution.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are running. Failure to comply may cause injury or death to personnel.
- Dangerously high voltage can exist across Current Transformer (CT) output with engine operating. CT can explode if disconnected from load with engine running. Do not disconnect CT with Alternating Current (AC) generator rotating. Failure to comply may cause injury or death to personnel by electrocution.
- Shut down generator sets before performing inspection of load cables. Failure to comply may cause injury or death to personnel by electrocution.
- Power is available to the convenience receptacle only when the main contactor is closed. Avoid accidental contact. Electrocution is possible. Failure to comply may cause injury or death to personnel.
- Ensure equipment/vehicles being used to jump-start the generator set are not touching. Touching of metal surfaces can cause improper grounding. Do not allow the cable ends to touch each other or any part of the generator set/vehicle/equipment other than the North Atlantic Treaty Organization (NATO) slave receptacle. Failure to comply may cause injury or death to personnel.
- NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main Direct Current (DC) circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.
- DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.
- The right-hand battery negative lead that connects directly to the grounding stud must be disconnected prior to disconnecting or removing batteries. Follow procedural steps in exact order given for removal and installation. Failure to comply may cause injury or death to personnel.
- Ensure the frequency of any device powered by the Ground Fault Circuit Interrupter (GFCI) convenience receptacle matches the frequency of the generator set. Failure to comply can cause serious injury or death to personnel.

## WARNING



### Heat

- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- When operating, winterization heater has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow heater to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Wear heat resistant gloves and avoid contacting hot metal surfaces with hands and exposed skin after components have been heated. Wear additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Top and some housing panels can get very hot. Allow panels to cool down before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Allow engine to cool from normal operating temperature prior to draining engine oil and removing oil filter. Failure to comply may cause injury or death to personnel.
- A turbocharger may become very hot and requires more time to cool down than other parts of engine assembly. Shut down generator set and allow it to cool sufficiently before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

## WARNING



### Jewelry/Clothing

- Metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry and do not wear loose clothing when working on equipment. Failure to comply may cause injury or death to personnel.
- While inspecting the operation of the generator set, do not inadvertently reach into the generator set. Failure to comply can cause injury or death to personnel.

## WARNING



### Lifting

- Comply with all lifting requirements. Observe the decals on equipment and parts that identify the weight and determine if assistance is needed. Maximum lift is 37 lb (16.8 kg) for one person, 74 lb (33.6 kg) for two persons, and 101 lb (45.8 kg) for three persons. Failure to comply may cause injury or death to personnel.
- When lifting the engine, use lifting equipment with minimum lifting capacity of 500 pounds (lb) (227 kilograms (kg)). Do not stand or put arms, legs, or any body part under hoisted load. Do not permit engine to swing while hoisted. Failure to comply may cause injury or death to personnel.
- Engine assembly weighs approximately 160 lb (72 kg). Use suitable lifting device with the capacity to lift the weight of the engine assembly. Failure to comply may cause injury or death to personnel.
- When lifting generator set, use lifting equipment with minimum lifting capacity of 1000 lb (453.6 kg). Do not stand or put arms, legs, or any body part under hoisted load. Do not permit generator set to swing. Failure to comply may cause injury or death to personnel.
- AC generator assembly weighs approximately 252 – 262 lb (114 – 119 kg). Use suitable lifting device with capacity to lift the weight of assembly. Do not stand or put arms, legs, or any body part under hoisted load. Failure to comply may cause injury or death to personnel.
- When lifting generator set, use lifting equipment with minimum lifting capacity of 1100 lb (500 kg). Do not stand or put arms, legs, or any body part under hoisted load. Do not permit generator set to swing. Failure to comply may cause injury or death to personnel.
- Engine assembly weighs approximately 355 lb (161 kg). Use suitable lifting device with the capacity to lift the weight of the engine assembly. Failure to comply may cause injury or death to personnel.

## WARNING



### Operating

Starting engine when the unit is partially disassembled is dangerous. Run the engine in this condition only as long as required to test operation. Keep away from unprotected moving engine parts during operation. Failure to comply may cause injury or death to personnel.

## WARNING



### Sharp Object

Cooling fan has sharp blades. Use caution and wear gloves when removing or installing fan. Failure to comply may cause injury or death to personnel.

## HAZARDOUS MATERIALS ICONS



CHEMICAL — Drops of liquid on hand shows that the material will cause burns or irritation to human skin or tissue.



EXPLOSION — Rapidly expanding symbol shows that the material may explode if subjected to high temperatures, source of ignition or high pressure.



EYE PROTECTION — Person with goggles shows that the material will injure the eyes.



FIRE — Flame shows that a material may ignite and cause burns.



POISON — Skull and crossbones shows that a material is poisonous or is a danger to life.



VAPOR — Human figure in a cloud shows that material vapors present a danger to life or health.

## HAZARDOUS MATERIALS WARNING DESCRIPTIONS

There is a potential risk that soldiers and other users may be exposed to chemical substances and diesel engine exhaust during the operation, maintenance, and repair of the AMMPS generator sets.

Potential sources of chemical substances include fuels, oils, lubricants, paints, cleaners/solvents, engine coolant fluids, cold start fluid, fire extinguishing agents, battery acid/chemicals, and miscellaneous chemicals used during the setup/operation/maintenance and sustainment throughout the life-cycle of the AMMPS generator sets.

### WARNING



This manual describes physical and chemical processes that may require the use of chemicals, solvents, paints, and/or other commercially available material. Users of the manual should obtain the Material Safety Data Sheets (MSDS), Occupational Safety and Health Act (OSHA) Form 20, or the equivalent from the manufacturers or suppliers of materials to be used. Failure to comply with all procedures, recommendations, warnings and cautions for safe use, handling, storage, and disposal of these materials may result in serious injury or death to personnel.

### WARNING



#### Batteries

- Battery acid can cause burns to skin and cause eye injury. Wear safety goggles and chemical gloves and avoid acid splash while working on the batteries. Failure to comply may cause injury or death to personnel.
- Batteries give off combustible gas. Do not smoke or use open flame when performing maintenance. Failure to comply may cause injury or death to personnel and damage to equipment.
- Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.
- Lifting batteries may cause back strain. Ensure proper lifting techniques are used when lifting batteries. Failure to comply may cause injury or death to personnel.



## WARNING



### Cleaning

- Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.
- Engine cooling system cleaning compound MIL-C-0010597F(ME) will not be used as a routine maintenance procedure each time antifreeze is added or drained from the cooling system. The compound will be used only when necessary to clean heavily rusted or partially clogged cooling systems. Failure to comply may cause injury or death to personnel.
- Engine cleaning compound MIL-C-0010597F(ME) for cooling systems is designed to clean the interiors of cooling systems, to neutralize residual cleaning acids, and to coat the interiors with a silicate. Failure to comply may cause injury or death to personnel.

## WARNING



### Exhaust

- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- Hot exhaust gases can ignite combustible materials. Allow room for safe discharge of hot gases. Failure to comply may cause injury or death to personnel.
- Exhaust discharge contains deadly gases, including carbon monoxide. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- Exhaust gases are most dangerous in places with poor ventilation. The best defense against exhaust gas poisoning is very good ventilation. To protect yourself and others, always obey the following rules:
  - Do not run engine indoors unless you have very good ventilation.
  - Do not idle engine for a long time unless there is very good ventilation.
  - Be alert at all times. Check for smell of exhaust fumes.
  - Failure to comply may cause injury or death to personnel.
- Exhaust gas poisoning causes dizziness, headache, loss of muscle control, sleepiness, coma, and death. If anyone shows signs of exhaust gas poisoning, get all personnel clear of AMMPs. Make sure they have lots of fresh air. Keep them warm, calm, and inactive. Get medical help. If anyone stops breathing, give artificial respiration. Failure to comply may cause injury or death to personnel.

## WARNING



### Eye

- Flying debris or material may enter eyes or strike the face. Wear appropriate eye/face protection while performing maintenance tasks. Failure to comply may cause injury or death to personnel.
- Eye protection is required when working with compressed air. Do not use compressed air to clean skin. Do not aim at personnel. Compressed air can propel particles at high velocity and injure eyes. Failure to comply may cause injury or death to personnel.

## WARNING



### Fuel

- Never inject fuel near a fire source. Atomized fuel is highly combustible. Fuel pressure is high enough to penetrate skin. Ensure that spray from the injector nozzle is directed away from all personnel. Direct contact with spray can cause skin cell destruction and blood poisoning. Skin and eye protection are required when working in contact with fuel. Failure to comply may cause injury or death to personnel and damage to equipment.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.
- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change soaked clothing promptly if exposed to fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (fuel fill static ground). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate Electrostatic Discharge (ESD). Fire and possible explosion can result. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to ESD. Fire and possible explosion may occur. Failure to comply may cause injury or death to personnel.
- Do not operate generator set if any fuel leaks are present. Fuel is combustible. Always perform PMCS before operation. Failure to comply may cause injury or death to personnel.
- Make sure engine control switch is only set to PRIME & RUN during fuel system checks. Failure to comply may cause injury or death to personnel.

## WARNING



### Fuel — Continued.

- Hot engine surfaces from engine and generator circuitry are possible sources of ignition. When hot refueling during unit operation with DF-1, DF-2, JP5, or JP8, avoid fuel splash and fuel spill. Do not smoke or use open flame when performing refueling. Remember PMCS are still required. Flames and possible explosion may result. Failure to comply may cause injury or death to personnel.

## WARNING



### High Temperature/Pressure

- Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Failure to comply may cause injury or death to personnel.
- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.
- Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.

## WARNING



### Noise

Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.



## LIST OF EFFECTIVE PAGES/WORK PACKAGES

NOTE: Zero in the "Change No." column indicates an original page or work package.

Date of issue for the original manual is:

Original 31 December 2011

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DEPARTMENTS OF THE ARMY, AIR FORCE,  
NAVY, AND HEADQUARTERS, U.S. MARINE CORPS  
WASHINGTON, D.C., 31 DECEMBER 2011

TECHNICAL MANUAL  
FIELD AND SUSTAINMENT MAINTENANCE MANUAL  
INCLUDING REPAIRS PARTS AND SPECIAL TOOLS LIST  
FOR

GENERATOR SET, SKID MOUNTED  
30KW ADVANCED MEDIUM MOBILE POWER SOURCES (AMMPS)  
MEP-1060, 50/60 Hz  
(NSN: 6115-01-561-7718) (EIC: MA7)  
MEP-1061, 400 Hz  
(NSN: 6115-01-561-7738) (EIC: MA8)

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS**

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Reports, as applicable by the requiring service, should be submitted as follows:

- (a) (A) Army — Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) located in the back of this manual, directly to: Commander, U.S. Army CECOM Life Cycle Management Command (LCMC), ATTN: AMSEL-LCL-ECM, Aberdeen Proving Ground, MD 21005-1846. You may also send in your recommended changes via electronic mail or by fax. Our fax number is 443-861-5521, DSN 848-5521. Our e-mail address is MONM-AMSELLEOPUBSCHG@conus.army.mil. Our online web address for entering and submitting DA Form 2028s is <http://edm.apg.army.mil/pubs/2028.html>.
- (b) (MC) Marine Corps — Submit notice of discrepancies or suggested changes on a NAVMC 10772. The NAVMC may be submitted using either of the following:
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- (c) (N) Navy — By letter directly to Commander, Space and Naval Warfare Systems Command, ATTN: SPAWAR 8122, Washington, DC 20363-5100.
- (d) (F) Air Force — By Air Force AFTO Form 22 TM Change Recommendation and Reply in accordance with paragraph 6-5, Section VI, TO 00-5-1 directly to prime ALC/MST.

A reply will be furnished to you.

**\*SUPERSEDURE NOTICE** — This manual supersedes TM 9-6115-752-24&P, TO 35C2-3-534-2, TM 09246c/11776A-OI/1, and TM 7610-LL-L1A-0028 dated 1 June 2011. Date of issue for the revised manual is 30 November 2011.

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**CHAPTER 1**

**GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND**

**THEORY OF OPERATION**

**FOR**

**AMMPS 30KW GENERATOR SET**

CHAPTER 1

GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND THEORY OF OPERATION

WORK PACKAGE INDEX

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**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**GENERAL INFORMATION**

---

**SCOPE**

This field and sustainment maintenance including repair parts and special tools list TM contains instructions for troubleshooting and maintaining the AMMPS 30 kW generator set.

**Type of Manual**

Field and sustainment maintenance including repair parts and special tools list.

**Model Number(s) and Equipment Name(s)**

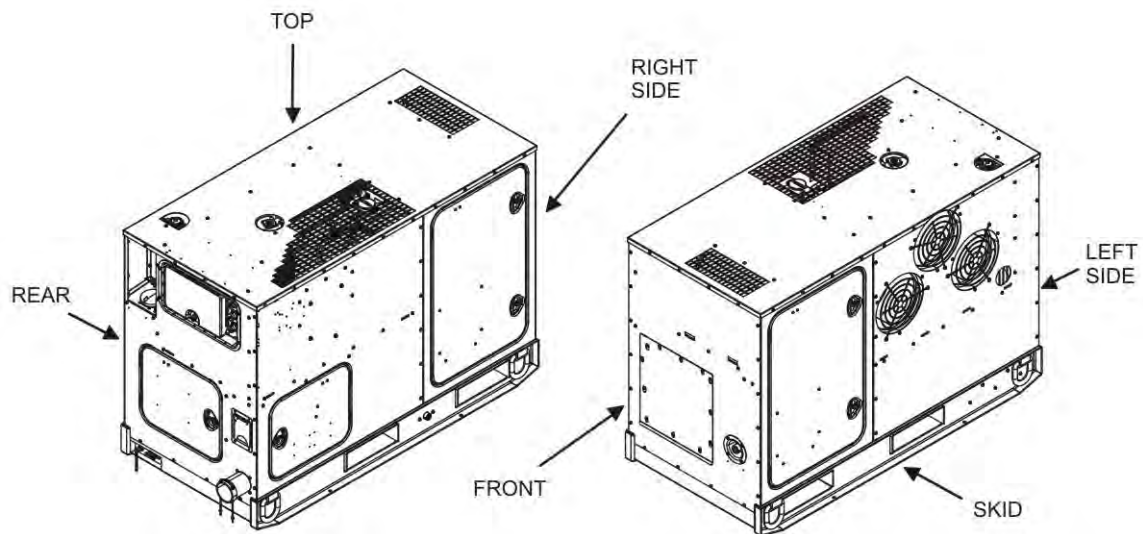
AMMPS 30 kW 50/60 and 400 hertz (Hz) generator set, skid mounted (Table 1):

**Table 1. Model Number(s) and Equipment Name(s).**

MODEL	HERTZ	NSN
MEP-1060	50/60	6115-01-561-7718
MEP-1061	400	6115-01-561-7738

**Purpose of Equipment**

The AMMPS 30 kW generator set is designed to provide tactical, quiet Alternating Current (AC) power in a combat setting. The generator set is designed for ease of transportation, operation, and maintenance. The Cummins QSB 3.3 Tier III engine supplied with the AMMPS 30 kW generator set eliminates wet stacking problems.



**Figure 1. Skid-Mounted 30 kW AMMPS Generator Set.**

## **MAINTENANCE FORMS, RECORDS, AND REPORTS**

- (1) (Army). Department of the Army forms and procedures used for equipment maintenance will be those prescribed by (as applicable) DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual; DA PAM 738-751, Functional Users Manual for the Army Maintenance Management System – Aviation (TAMMS-A); or AR 700-138, Army Logistics Readiness and Sustainability.
- (2) (Marine Corps). Maintenance forms and records used by Marine Corps personnel are prescribed by TM 4700-15/1.
- (3) (Air Force). Maintenance forms and records used by Air Force personnel are prescribed in AFI 21-101 and the applicable TO 00-20, Series of Technical Orders.
- (4) (Navy). Navy users should refer to their service peculiar directives to determine applicable maintenance forms and records to be used.

## **REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)**

(1) (Army). If your equipment needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. If you have Internet access, the easiest and fastest way to report problems or suggestions is to follow the instructions and links below:

If you have a user's account, you can submit the PQDR for ALL CECOM (B16) Warranty, EIR, and PQDRs (including those B16 Aviation related) through the Navy's Web Product Quality Deficiency Reporting (PQDR) site, <http://www.nslcptsmh.csd.disa.mil/webpqdr/webpqdr.htm>. If you do not, either go to EZPQDR, <http://www.nslcptsmh.csd.disa.mil/webpqdr/files/ezpqdr.htm> and input your PQDR there, or establish a new account. New accounts can be established at the following address: <http://www.nslcptsmh.csd.disa.mil/accessforms/uarform.htm>.

CECOM (B16) aviation PQDRs will not go to AMCOMs Joint Deficiency Reporting System (JDRS). If AMCOM should get a CECOM aviation PQDR, they will redirect it to the CECOM PQDR Team.

Use the PQDR for Warranties, EIRs, and PQDRs. There is a block on the PQDR that can be clicked if it is a Warranty. The originator can still put in the description that they want this investigated as an EIR and then enter what the issue is.

You may also submit your SF 368 (Product Quality Deficiency Report) via email (MONM-AMSELLEODCSCFO@CONUS.ARMY.MIL), facsimile (732-532-2929), or regular mail (call 732-532-8843 for the current mailing address).

We will send you a reply.

- (2) (Air Force). Air Force personnel are encouraged to submit EIRs IAW Air Force Regulation (AFR) 900-4.
- (3) (Navy). Navy personnel are encouraged to submit EIRs through their local Beneficial Suggestion Program.
- (4) (Marine Corps). QDR shall be reported on SF 368 IAW MCO P4855.10, Product Quality Deficiency Report Manual. Submit to Commanding General, Marine Corps Logistics Base (Code 850), Albany, Georgia 31704-5000. A reply will be furnished to you.

## **CORROSION PREVENTION AND CONTROL (CPC)**

Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items.

Corrosion specifically occurs with metals. It is an electrochemical process that causes the degradation of metals. It is commonly caused by exposure to moisture, acids, bases, or salts. An example is the rusting of iron. Corrosion damage in metals can be seen, depending on the metal, as tarnishing, pitting, fogging, surface residue, and/or cracking.



Plastics, composites, and rubbers can also degrade. Degradation is caused by thermal (heat), oxidation (oxygen), solvation (solvents), or photolytic (light, typically Ultraviolet (UV)) processes. The most common exposures are excessive heat or light. Damage from these processes will appear as cracking, softening, swelling, and/or breaking. SF 368, Product Quality Deficiency Report, should be submitted to the address specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

For aircraft TMs, this information shall include a reference to TM 1-1500-344-23, volumes 1 through 4 (Cleaning and Corrosion Control).

### **OZONE-DEPLETING SUBSTANCES (ODS)**

The use of Class 1 Ozone-Depleting Substances (ODS) for new acquisitions has been curtailed by Section 326 of the National Defense Authorization Act of Fiscal Year 1993 (Public Law 102, 484) and related Army policy. ODS are listed in Title VI of the Clean Air Act. For systems procured and fielded prior to the effectiveness of the above law (June 1993) that use a Class 1 ODS, a listing of those substances required to operate and maintain the system shall be included in the TM. This requirement applies to any system procured or fielded after June 1993 that requires the use of a Class 1 ODS, where the use of the ODS has been properly documented and waived. The procuring activity will provide a list of Class 1 ODS on request.

### **DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE**

Destruction of Army electronics materiel to prevent enemy use shall be IAW TM 750-244-2.

Destruction of Air Force materiel to prevent enemy use shall be IAW AFI 33-201.

Destruction of Navy materiel to prevent enemy use shall be IAW Navy direction.

Destruction of Marine Corps materiel to prevent enemy use shall be IAW MC direction.

### **DEMOLITION OF MARINE CORPS MATERIEL TO PREVENT ENEMY USE**

#### **Demolition to Render the Generator Set Inoperative**

1. When capture or abandonment of the generator set to an enemy is imminent, the responsible unit commander must make the decision to either destroy or render the equipment inoperative.
2. Based on this decision, orders are issued which cover the desired extent of destruction.
  - a. Operators should be thoroughly familiar with all methods of destruction without referencing any particular manual.
  - b. Demolition of the generator set can be accomplished by explosives, fire, or tools such as a sledge hammer, pick, or ax. Demolition can also be accomplished by misuse.
3. The method used will depend on the time available and the availability of these materials in the vicinity of the generator set.
4. Demolition by mechanical means:
  - a. Use hammer, pick, ax, or any other available tool to destroy vital engine and control parts.
  - b. Control box, fuel injection lines, and the radiator should be smashed, engine and control box wires pulled and cut, and any other external engine components (fuel filter, alternator) should be damaged enough to make them inoperable.
5. Demolition by misuse:
  - a. Drain diesel generator crankcase oil.
  - b. Block diesel generator engine air supply ports.
  - c. Start diesel generator engine and allow it to operate until it fails.

- d. Pour sand, dirt, or other available abrasive compound in all exposed surfaces and access ports of the diesel engine and generator.
- e. Drain engine coolant.
- 6. Demolition by burning: Complete as much mechanical damage as possible, and then saturate unit with combustible fuel and ignite.
- 7. Demolition by explosives: Place explosive charges in priority order (Table 2).

**Table 2. Demolition Priority Levels.**

PRIORITY LEVEL	COMPONENT	EXPLOSIVE CHARGE REQUIRED
1	Generator Engine	1 pound (lb)
2	Control Box	1 lb
3	Generator Housing	1 lb
4	Housing/Structure	2 lb

**PREPARATION FOR STORAGE OR SHIPMENT**

Administrative storage of equipment issued to and used by Army activities will have Preventive Maintenance Checks and Services (PMCS) performed before storing. When removing the equipment from administrative storage, the PMCS checks should be performed to assure operational readiness.

**WARRANTY INFORMATION**

1. The AMMPS 30 kW generator set is warranted for 1800 hours (hr) of operation or 36 months, whichever occurs first. The warranty starts on the date the equipment is accepted by the Government as defined on the Date Inspected block and the Date Manufactured block on the generator set data plate. The warranty block on the data plate contains the warranty period (hours/time limit) that the warranty covers. This warranty shall include furnishing of new items to replace any that prove to be nonconforming and/or defect within the warranty period. Such items shall be returned to the contractor's plant without cost to the Government.

The warranty is not an appropriate vehicle for maintaining readiness of AMMPS generator sets. The normal supply system should be used to maintain readiness. Parts provided in response to warranty claims should be used to replenish your supply stocks.

The Contractor, Cummins Power Generation (CPG), guarantees the supplies and parts at the time of acceptance or delivery conform to the design and manufacturing requirements, are free from all defects in materials and workmanship, and conform to all performance requirements delineated in the applicable specifications of the contract. This guarantee will be for 1800 operating hours on each unit, or 36 months, whichever occurs first.

The guarantee shall include furnishing of new items to replace any that prove to be nonconforming and/or defective within the warranty period. Such items shall be furnished without cost to the Government. When repair or replacement requires transportation of the nonconforming or defective items, shipping cost from the line item delivery point (irrespective of the Foreign Operating Base (F.O.B.) point or the point of acceptance) to the Contractor's plant and return shall be at the expense of the Contractor.

2. The Government activity responsible for administrative functions of the warranty program is the Commander, US Army CECOM LCMC, Attn: AMSEL-LC-LEO-DSS-PQ Aberdeen, W15GK8. Call or send message to voice (443) 861-6310 or DSN 848-6310 or (443) 861-6313 or DSN 848-6313; FAX (443) 861-6356 or (443) 861-6356. Email: AMSEL-LC-LEO-D-CSCFO@conus.army.mil. The following paragraphs describe the responsibilities of each Government activity.

- a. Failure to follow published maintenance procedures at the maintenance levels specified in the appropriate technical manual could result in a warranty claim being declared invalid. The following maintenance requirements must be performed: Preventive Maintenance Checks and Services (PMCS). All PMCS requirements are contained in the Operator's Manual (TM 9-6115-752-10) and the Field and Sustainment Maintenance Manual (TM 9-6115-752-24&P). Corrective maintenance for the equipment is given in TM 9-6115-752-24&P based upon the approved Maintenance Allocation Chart (MAC). Any deviation from the normal maintenance and repair procedures is not authorized.
  - b. The owning unit is responsible for operating and maintaining the generator sets in accordance with the technical manuals. All PMCS and lubrication order requirements must be met. In addition, all operating procedures will be strictly followed while observing all warnings, cautions, and notes. Upon experiencing a warranty-related failure, the owning unit shall prepare the required documentation.
  - c. Warranty Control Office Responsibilities. CECOM Warranty Control Office (WARCO) will handle all warranty claims generated by field units with exception of FMS customers. WARCO will determine whether or not each claim is a candidate for warranty consideration. The Government will initiate Warranty Claim Actions (WCA) for warranty items and Quality Deficiency Reports (QDR) for systematic failures in accordance with DA PAM 750-8 and this Technical Bulletin. CECOM WARCO will coordinate warranty claims with CECOM Contracting Officer as appropriate. FMS customers will administer their own WCA and QDRs.
  - d. Army Oil Analysis Program (AOAP). There are no warranty components of the generator set enrolled in the AOAP.
  - e. Alteration/Modifications. Alterations and modifications shall not be made unless expressly authorized or directed by: PM-MEP.
3. Nullification. The following examples of actions which will nullify the warranty are examples only and are not inclusive and do not alter the terms of the contract warranty provisions.
  - a. Any maintenance/repair procedure, improper use or operation, abuse, improper environmental exposure, and installation methods which are outside of the published guidelines and procedures contained in the technical manuals can be cause for nullifying a warranty claim.
  - b. In addition, the following actions will be cause for nullification of the warranty:
    - (1) Subsequent damage to components as a result of continued use after a component malfunction.
    - (2) Damage caused by combat conditions or acts of war.
    - (3) Operation of the unit with the BATTLESHORT switch on.
    - (4) Operation of the unit in an environment beyond that specified in the Operator's Technical Manual (TM 9-6115-752-10).
    - (5) Installation of equipment not in accordance with the technical manuals.
    - (6) Any abuse such as improper use, repair, or handling of warranted items.
    - (7) Any damage caused by (1) acts of God or the public enemy, (2) acts of the Government in either its sovereign or contractual capacity, (3) fires, (4) floods, or (5) unusually severe weather beyond the performance specifications.
    - (8) Use of improper or contaminated fuels, coolants, or lubricants.
  - c. Abuse Determination. In cases where generator set abuse is suspected (i.e., not obvious), the CECOM WARCO or Prime Contractor shall initiate an inquiry into the circumstances leading up to the generator set failure. This warranty is void for any generator set for which abuse is determined. The generator set may be returned to a functional condition by performing the necessary repair procedures in TM 9-6115-752-24&P.
4. Claim Procedures. The following procedures provide instructions for processing warranty claims (refer to DA PAM 750-8).

- a. Identification of Failed Items. Generator set components that experience a warranty failure shall be tagged/identified to prevent improper repair or use. Tag the generator set component with an Exchange Tag, DA Form 2402 and complete the SF 368 form (refer to DA PAM 750-8). There are no items requiring special handling, storage, or shipment during the processing or warranty claims. Warranty claims can be electronically submitted through the NAVSEA (Naval Sea Systems Command (NAVSEA)) website under Submit Quality Deficiency Reports. The Website is located at <http://www.nslcptsmh.csd.disa.mil/>.
- b. Disposition. Upon notification by CECOM WARCO that the item is to be returned to the Contractor, the using activity will package and return in accordance with the disposition instructions provided by the CECOM WARCO. A copy of the Product Quality Deficiency Report, SF 368 (refer to DA PAM 750-8) will be forwarded with the failed item.  
  
The using activity will also visually inspect the repaired part for evidence of physical damage incurred during shipping. No item testing will be required to ensure that the component was repaired properly. The Contractor assumes all responsibility for testing after repair.
- c. Reimbursement for Army Repair. Reimbursement for Army repair is not authorized by this warranty.
- d. Claim Denials/Disputes. Claim denials or disputes will be coordinated through the Contractor Warranty Administrator and the CECOM WARCO.
- e. Reporting. Reporting or recording action on a failed item shall be as specified in DA PAM 750-8. Contractor unique forms shall not be used.

## NOMENCLATURE CROSS-REFERENCE LIST

Shortened nomenclature is used in this TM to make procedures easier to read. A cross-reference between the shortened, common name used in this manual and the official nomenclature is provided below.

Common Name	Official Nomenclature
30 kW Genset	30 kW Generator Set
24-VDC Electrical System	DC Electrical System
24-VDC Electrical System	Engine Electrical System
AC Generator	AC Generator Assembly
Cylinder Head	Cylinder Head Assembly
DCS	Control Box Assembly
DCS	Control Box
DCS Mounting Bracket	Control Box Frame
DCS Mounting Bracket	Control Box Side Panels
DCS Mounting Bracket	Control Box Tray
DCS Wiring Harness	Control Box Wiring Harness
Dipstick	Oil-Level Bayonet Gage
Doors	Access Doors
Engine Block	Main Bearing Case Assembly
Engine Block	Short Block
Engine Block Assembly	Crankcase Assembly
Engine Block Assembly	Short Block Assembly
Flywheel	Flywheel Assembly
Front Body Panel	Front Housing Section
Fuel Injection System	Engine Fuel System
Gear Case	Gear Case Assembly
Housing	Housing Assembly
Not used	Engine Accessories
Not used	End Bell Assembly
Oil Drain Hose Assembly	Oil Drain Assembly
Operator Control Panel	Main Control Panel
Output Box Assembly	Output Box
Output Box Harness	Output Box Harness And Cables

**Common Name****Official Nomenclature**

Output Terminal Board  
 Rear Body Panel  
 Rectifier  
 Speed Governor  
 Starter  
 Top Body Panel  
 Unit Skid

Output Load Terminal Board  
 Rear Housing Section  
 Rectifier Assembly  
 Governor System  
 Starter Assembly  
 Top Housing Section  
 Skid Assembly

**LIST OF ABBREVIATIONS/ACRONYMS**

Acronyms and abbreviations used in this TM are provided and defined below.

**Abbreviation/Acronym****Definition**

-	Negative
%	Percent
+	Positive
±	Plus Or Minus
°	Degree
°C	Degree Celsius
°F	Degree Fahrenheit
Ω	Ohm
mΩ	Megohm
A	Army
AAL	Additional Authorization List
AC	Alternating Current
ADC	Amperes Direct Current
AF	Air Force
AFI	Air Force Instruction
AFR	Air Force Regulation
AFTO	Air Force Technical Order
AGM	Absorbed Glass Mat
AH	Ampere Hour
AMMPS	Advanced Medium Mobile Power Sources
Amp	Ampere
AM – VM	Ampere Meter – Voltage Meter
AOAP	Army Oil Analysis Program
AR	Army Regulation
Aux	Auxiliary
AUX CONTACT	Auxiliary Contact
AVR	Automatic Voltage Regulation
BII	Basic Issue Items
BOI	Basis Of Issue
C	Crew (level of maintenance)
CAGEC	Commercial and Government Entity Code
CARC	Chemical Agent Resistant Coating
CB	Circuit Breaker
CBRN	Chemical, Biological, Radiological, and Nuclear
CCV	Close Crankcase Ventilation
CECOM LCMC	Communications-Electronics Command Life Cycle Management Command
cm	Centimeter
cm <sup>3</sup>	Cubic Centimeters

Abbreviation/Acronym	Definition
CPC	Corrosion Prevention and Control
CPG	Cummins Power Generation
CSV	Comma-Separated Values
CT	Current Transformer
CTA	Common Table of Allowances
CTL	Control
D	Depot (level of maintenance)
DA	Department of the Army
DC	Direct Current
DCS	Digital Control System
DD	Department Of Defense (forms only)
DF	Diesel Fuel
DI	Direct Injection
DoD	Department of Defense
DS2	Decontamination Solution number 2
E	Empty
ea.	Each
ECM	Electronic Control Module
ECP	Engineering Change Proposal
EIR	Equipment Improvement Recommendation
e-mail	Electronic mail
EMP	Electromagnetic Pulse
ESC	Equipment Service Criteria
ESD	Electrostatic Discharge
E-Stop	Emergency Stop
F	Field (level of maintenance)
F	Full
FGC	Functional Group Code
Fig.	Figure
FM	Field Manual
FOB	Foreign Operating Base
ft	Foot
ft/lb	Foot/pound
gal	Gallon
Genset	Generator Set
GFCI	Ground Fault Circuit Interrupter
GFI	Ground Fault Interrupter
Glw plug	Glow Plug
GMTK	General Mechanic's Tool Kit
GND	Ground
Gov	Governor
GPH	Gallons Per Hour
H	Below Depot (level of maintenance)
hr	Hour
Hz	Hertz
IAW	In Accordance With
IBM	International Business Machine
ID	Identification

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Abbreviation/Acronym	Definition
in	Inch
in/lb	Inch-pound
in <sup>3</sup>	Cubic inches
IUID	Individual Unit Identification
JDRS	Joint Deficiency Reporting System
JP	Jet Propulsion Fuel
kg	Kilogram
kPa	KiloPascal
kVAR	Kilovolt-Ampere Reactive
kW	Kilowatt
L	Liter
lb	Pound
LCD	Liquid Crystal Display
L/Hr	Liters per hour
L-L	Line-to-Line
L-N	Line-to-Neutral
LRU	Line Replaceable Unit
m	Meter
mA	MilliAmpere
MAC	Maintenance Allocation Chart
MC	Marine Corps
MCO	Marine Corps Order
MEP	Mobile Electric Power
MG	Mobile Generator
min	Minute
mL	Milliliter
mm	Millimeter
MPa	MegaPascals
ms	Millisecond
MSD	Maintenance Support Device
MSDS	Material Safety Data Sheets
MTOE	Modified Table of Organization and Equipment
MWO	Modification Work Order
N/A	Not Applicable
N	Navy
N	Neutral
NATO	North Atlantic Treaty Organization
NAVSEA	Naval Sea Systems Command
NBC	Nuclear Biological Chemical
NG	National Guard
NEMA	National Electrical Manufacturers Association
NHA	Next Higher Assembly
NIIN	National Item Identification Number
Nm	Newton meter
NMWR	National Maintenance Work Requirement
No.	Number
NSN	National Stock Number
ODS	Ozone-Depleting Substances

Abbreviation/Acronym	Definition
OEM	Original Equipment Manufacture
OOR	Out Of Range
OSHA	Occupational Safety and Health Act
oz	Ounce
PAM	Pamphlet
PC	Personal Computer
PDA	Personal Data Assistant
PMCS	Preventive Maintenance Checks and Services
PMG	Permanent Magnet Generator
P/N	Part Number
PP	Power Plant
PQDR	Product Quality Deficiency Report
Press	Pressure
psi	Pounds per square inch
PU	Power Unit
PWM	Pulse Width Modulated
QDR	Quality Deficiency Report
qt	Quart
Qty	Quantity
Qty. Recm.	Quantity Recommended
Qty. Rqr.	Quantity Required
RP	Relay Panel
rpm	Revolutions per minute
RPSTL	Repair Parts and Special Tools List
RTC	Real Time Clock
SAE	Society Of Automotive Engineers
sec	Second
SF	Standard Form
SMR	Source, Maintenance, And Recoverability
SOP	Standard Operating Procedure
SRA	Specialized Repair Activity
STB	Super-Tropical Bleach
TAMMS	The Army Maintenance Management System
TAMMS-A	The Army Maintenance Management System — Aviation
TBD	To Be Determined
TDA	Tactical Decision Aid
TDC	Top Dead Center
TDR	Transportation Discrepancy Report
Temp	Temperature
TM	Technical Manual
TMDE	Test, Measurement, And Diagnostic Equipment
TO	Technical Order
U/I	Unit of Issue
UOC	Usable On Code
USB	Universal Serial Bus
UV	Ultraviolet
V	Volt



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Abbreviation/Acronym	Definition
VAC	Volts Alternating Current
VDC	Volts Direct Current
WARCO	Warranty Control Office
WP	Work Package
Wtr	Winterization

## QUALITY OF MATERIAL

Material used for replacement, repair, or modification must meet the requirements of this AMMPS 30 kW generator set field and sustainment maintenance manual. If quality of material requirements are not stated in this field and sustainment maintenance manual, the material must meet the requirements of the drawings, standards, specifications, or approved Engineering Change Proposals (ECP) applicable to the subject equipment.

## SAFETY, CARE, AND HANDLING

**ESD.** The AMMPS 30 kW generator set contains no radioactive components or parts or radioactive material requiring special handling or consideration. The AMMPS 30 kW generator set DCS contains printed circuit boards and control cards requiring special handling to protect them from ESD when being serviced. The operator does not need to use special handling for operation of the AMMPS 30 kW generator set.

This manual describes physical and chemical processes that may require the use of chemicals, solvents, paints, or other commercially available materials. Users of the TM should obtain the Material Safety Data Sheets (MSDS) (OSHA Form 20 or equivalent) from the manufacturers or suppliers of materials to be used. Users must be completely familiar with manufacturer/supplier information and adhere to their procedures, recommendations, warnings, and cautions for safe use, handling, storage, and disposal of these materials.

## END OF WORK PACKAGE



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**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**EQUIPMENT DESCRIPTION AND DATA**

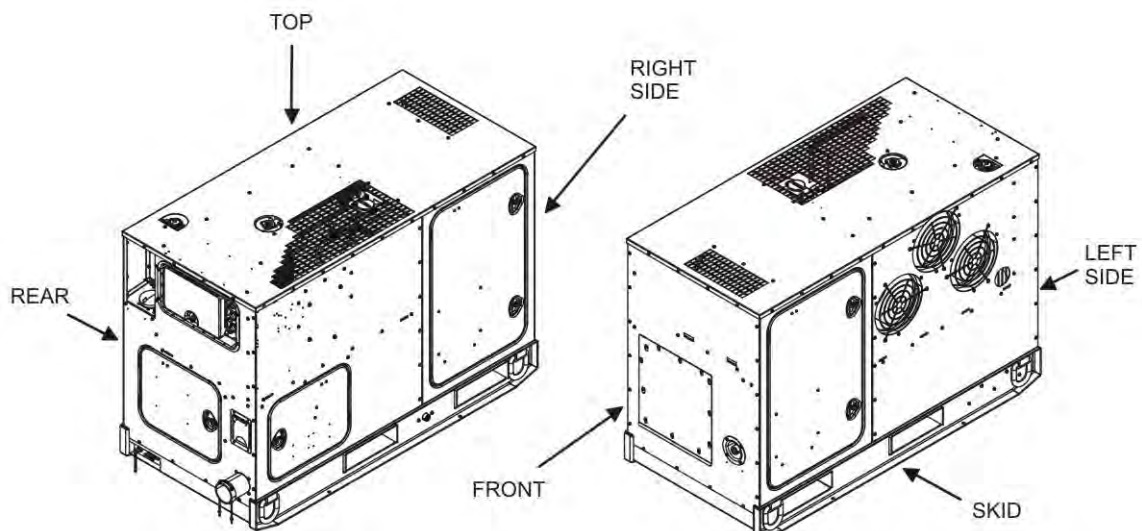
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**EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES**

The AMMPS 30 kW generator set (Figure 1) is a fully-enclosed, self-contained, skid-mounted mobile unit. The generator set consists of six major assemblies; engine assembly, internal fuel assembly, external fuel assembly (not shown), AC generator assembly, Digital Control System (DCS), and output box assembly. An optional winterization kit is available for installation in cold weather climates.

The AMMPS 30 kW generator set is designed to accommodate the continuing proliferation of electronics (computers, Personal Data Assistants (PDA), etc.), life support systems, and global communications necessary in today's battlefield that require a continuous, uninterrupted flow of electricity to accommodate all tactical situations.

**LOCATION AND DESCRIPTION OF MAJOR COMPONENTS**



**Figure 1. AMMPS 30 kW Generator Set with Doors Closed.**

**HOUSING**

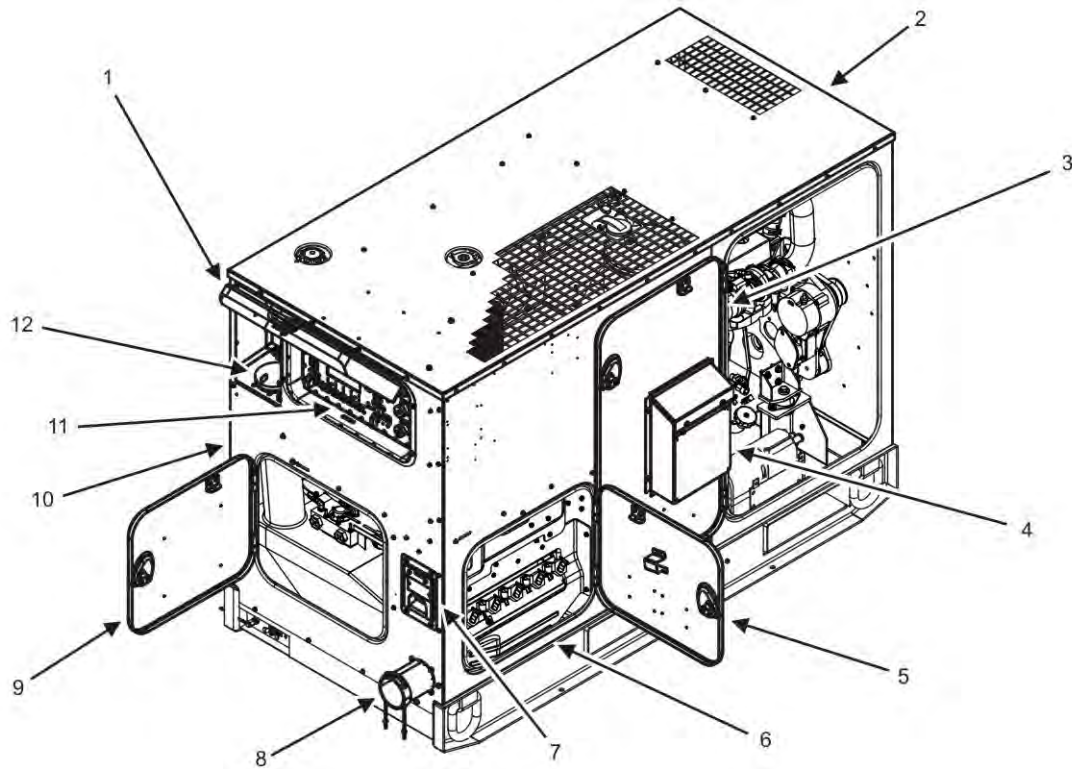
A steel housing consisting of several individual body panels encloses the AMMPS 30 kW generator set and protects it from the environment. The housing provides acoustical protection, entry access to generator set assemblies, control of air flow over internal surfaces, and mounting for generator set components.

The steel housing is durable enough so that no damage should occur within normal usage. The housing design prevents the invasion of wind-driven rain, snow, and sand to the interior of the units through the design and placement of the louver and a rain cap. The Chemical Agent Resistant Coating (CARC) paint, polyurethane coating on circuit boards, sealed connectors, and immersion-proof fan motor housing provide additional protection against moisture and condensation damage.

Self-supporting hinged doors allow easy interior access for scheduled service and preventive maintenance. Individual body panels are removable to allow additional access for replacement and service of major components.

## Body Panels

All body panels are connected using corrosion-resistant captive nuts. All seals are interference fit to the housing panels.



**Figure 2. Rear and Right-Side View with Doors Open.**

**Top Body Panel (Figure 2, Item 2).** The top body panel shields components from the elements.

**Rear Body Panel (Figure 2, Item 10).** Located at the rear of the generator set, the rear body panel contains the DCS access door (Figure 2, Item 1), DCS (Figure 2, Item 11), rear access door (Figure 2, Item 9), convenience receptacle (Figure 2, Item 7), entrance for load cables (Figure 2, Item 8), and fuel fill (Figure 2, Item 12).

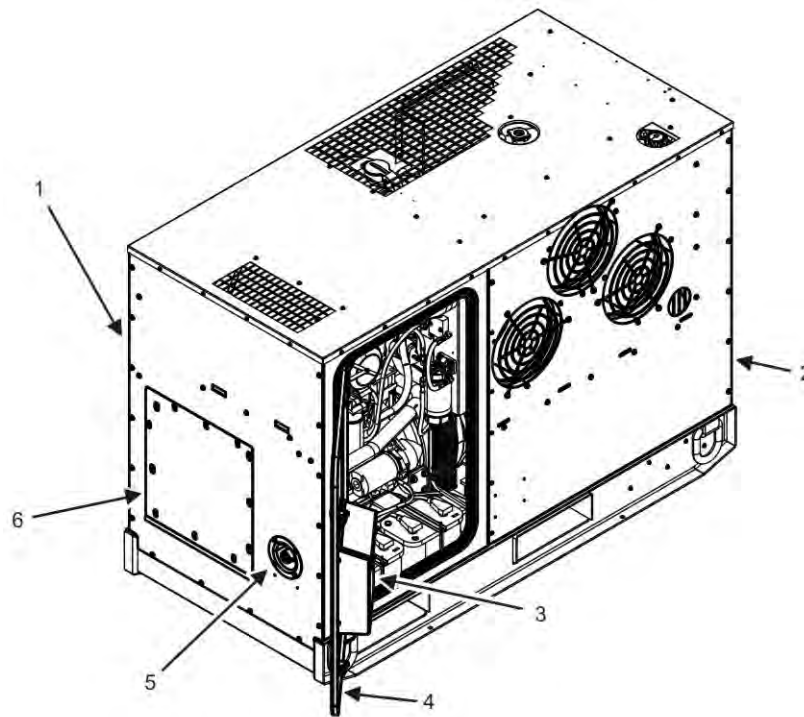
**Right-Side Body Panel (Figure 2, Item 6).** Located on the right side of the generator set, the right-side body panel contains the right-side access door (Figure 2, Item 3) and output box door (Figure 2, Item 5).

**Storage Box (Figure 2, Item 4).** An accessory box, stenciled Storage Box, has been installed on the inside of the right-side access door (Figure 2, Item 3) to provide space for the paralleling cable, grounding rod connecting hardware, oil drain nipple, and auxiliary fuel line.

**Front Body Panel (Figure 3, Item 1).** The front body panel is located on the front of the generator set and contains the NATO slave receptacle (Figure 3, Item 5) and the access panel (Figure 3, Item 6).

**Left-Side Body Panel (Figure 3, Item 2).** The left-side body panel is located on the left side of the generator set and contains the left-side access door (Figure 3, Item 4).

**Document Box (Figure 3, Item 3).** An accessory box, stenciled Document Box, has been installed on the inside of the left-side access door (Figure 3, Item 4) to provide space for the TM and laminated electrical drawings.



**Figure 3. Front and Left-Side View With Door Open.**

**Identification (ID) Plates.** Identification (ID) plates and placards for system safety and operation are attached to the housing. See TM 9-6115-752-10 for the placement and contents of the identification and safety placards.

#### **DCS (Figure 2, Item 11)**

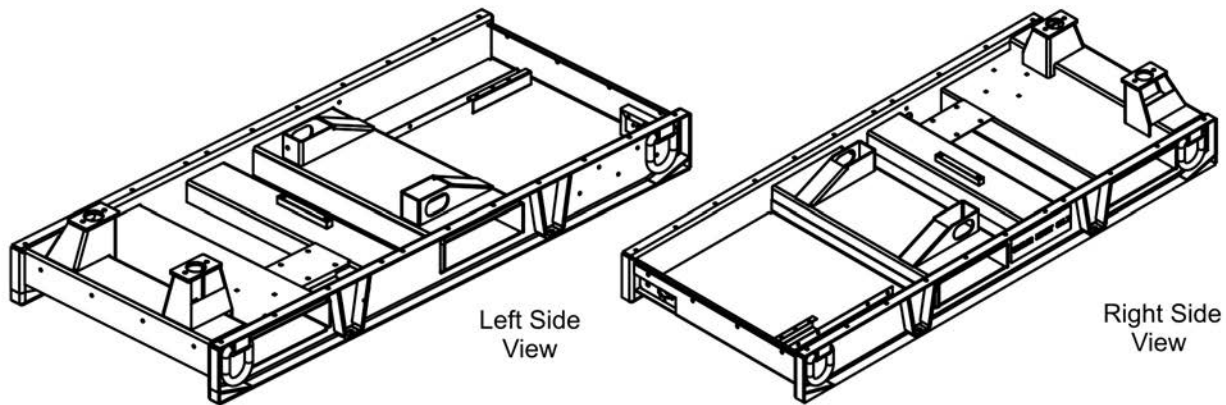
The DCS is a microprocessor-based control that allows the operator and maintainer to: start/stop the generator set and regulate fuel source using the engine control switch; stop the generator set in emergencies with the EMERGENCY STOP switch; operate the contactor using the AC CIRCUIT INTERRUPT switch; adjust voltage, frequency, gain, panel lights, and other settings using the adjustment screens with the soft keys; clear/reset generator faults using the FAULT RESET control; operate in parallel with other generator sets using the UNIT PARALLEL switch; and perform other necessary functions to provide output power.

The control unit is powered by the generator set 24-VDC system. The controls are fully functional after approximately 4 seconds (sec) (boot-up time). Once the generator set model, frequency, and voltage configurations are determined by the DCS programming, the control automatically adjusts the display value limits, menus, and operational parameters accordingly, reducing potential operator error.

The AMMPS 30 kW generator sets provide limited remote operation capabilities through interface with an International Business Machine (IBM)-compatible Personal Computer (PC). The operational status of the generator set can be monitored, battleshort conditions can be set and released, and emergency stop can be executed from up to a 250-foot (ft) (76.2-meter (m)) distance. Loss of signal between the remote monitoring site and the generator set does not adversely affect the generator set operation.

The DCS display is a colored Liquid Crystal Display (LCD) with a 6.5-inch (in) (165.1-millimeter (mm)), diagonal viewing area. It provides a combination of switches and LCD soft keys to allow the operator and maintainer to control the generator set.

## SKID ASSEMBLY

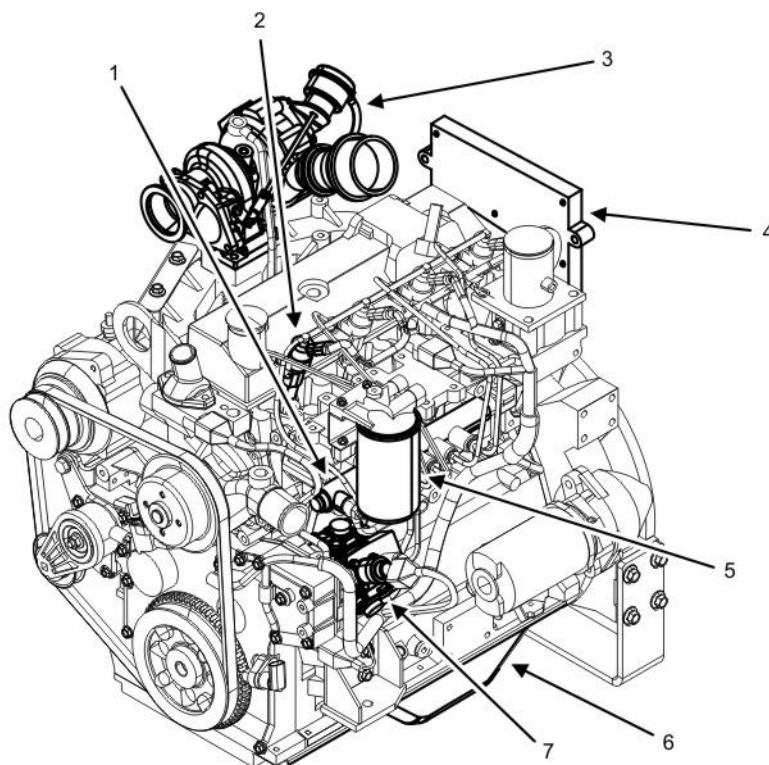


**Figure 4. Skid.**

The housing sits on a steel skid (Figure 4) that extends beyond the housing walls by approximately 0.39 in (10 mm). The engine and AC generator are directly mounted to the skid with the focus toward the roll inertia axis. This improves vibration isolation. The skid is equipped with forklift pockets for transportation capability. The skid base has drains located between the forklift pockets on each side for draining liquids from the generator set.

## ENGINE ASSEMBLY

The AMMPS 30 kW generator set uses a Cummins QSB 3.3 Tier III engine. The vertical, water-cooled, four-cycle Direct Injection (DI) diesel engine utilizes a four-cylinder, turbocharged process. It consists of the cylinder head and valve cover, crankcase assembly, pistons, main bearing case, and lubrication system. It is mounted to the skid toward the front body panel of the generator set. See Figure 5 and Figure 6 for a breakdown of major engine components.



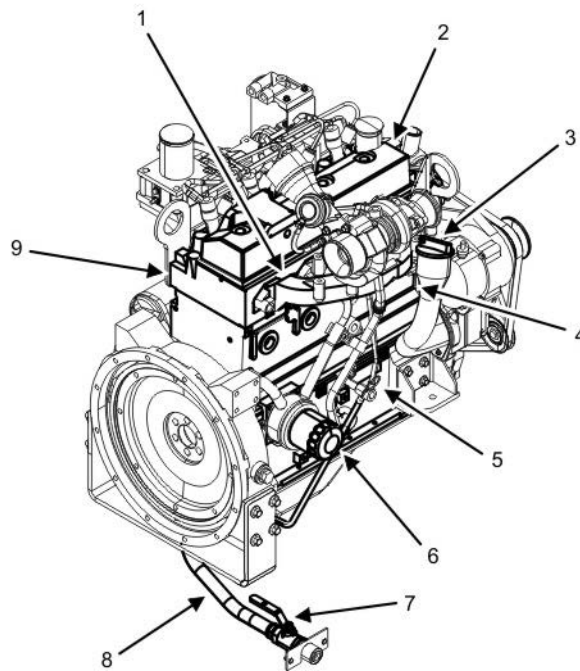
**Figure 5. Engine Components — Left Side.**

### **Major Engine Components/Assemblies**

Major engine components/assemblies include: cylinder head and valve cover assembly, block assembly, lubrication system, Electronic Control Module (ECM), fuel system, cooling system, DC electrical system, and air intake and exhaust system.

**Fuel Injection System.** Once fuel has passed through the fuel filter/water separator (Figure 8, Item 7), the fuel passes through the spin-on fuel filter (Figure 5, Item 5). From the spin-on fuel filter (Figure 5, Item 5) the fuel passes to the fuel injection pump (Figure 5, Item 7). The fuel injection pump (Figure 5, Item 7) sends high-pressure fuel for each of the engine's four cylinders into the fuel injector rail (Figure 5, Item 1). From the fuel injector rail (Figure 5, Item 1) the fuel travels through high-pressure injector lines to the fuel injectors (Figure 5, Item 2) which are electronically activated to inject the fuel into each cylinder. The injector then sprays the fuel at high pressure into the cylinder where it is burned.

**ECM (Figure 5, Item 4).** The ECM receives data from a variety of sensors. The data is processed through an on-board computer that controls fuel flow and timing to ensure the most efficient use of fuel. The ECM also monitors the engine for proper performance and alerts the operator and maintainer of developing problems within the engine.



**Figure 6. Engine Components — Right-Side.**

**Cylinder Head (Figure 6, Item 9) and Valve Cover (Figure 6, Item 2) Assembly.** The cylinder head assembly is located on the top of the block assembly (Figure 6, Item 4) seals the upper ends of the cylinders to provide compression, protects the portion of the engine where combustion takes place, and houses the valve assembly. The valve cover is located on top of the cylinder head assembly and protects the valve assembly from contamination.

**Block Assembly (Figure 6, Item 4).** The block assembly houses the connecting rods, crankshaft, pistons, camshaft, and bearings.

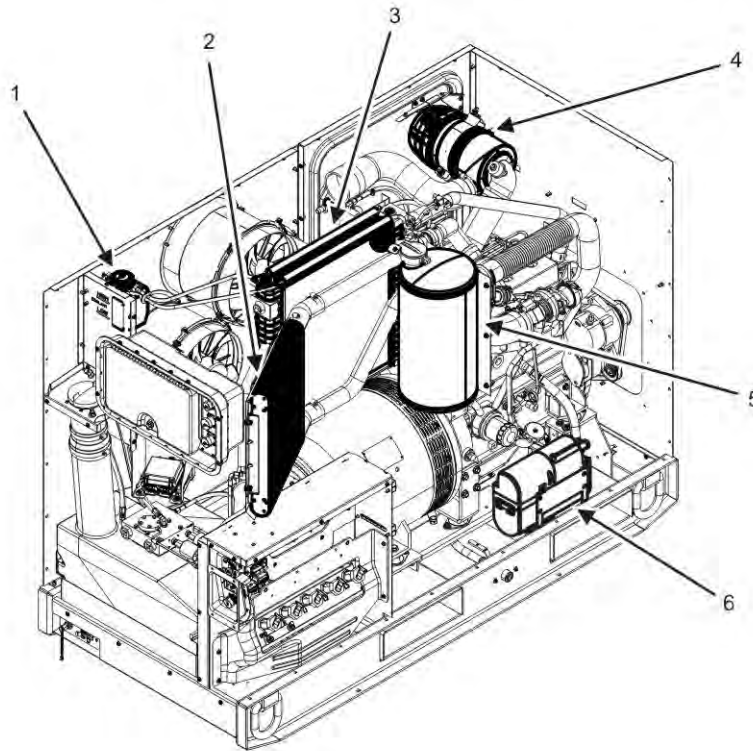
**Lubrication System.** The AMMPS 30 kW generator set lubrication system is compatible with MIL-PRF-21260E preservative oil. The lubricating oil conforms to MIL-PRF-46167C and MIL PRF-2104H.

Operators can safely check and add oil to the lubricating system while the generator set is operating or in the off condition. The lubrication system includes an oil-filler opening (Figure 6, Item 3) with captive cap to permit oil-filling from a standard 8-qt capacity can and a readily-accessible oil-level bayonet gage (dipstick) (Figure 6, Item 5). The dipstick is marked to ensure accurate reading of oil levels. See TM 9-6115-752-10 for more information.

**Oil Drain Assembly (Figure 6, Item 8).** The oil drain assembly is located between the oil pan (Figure 5, Item 6) and the unit skid. It allows the engine oil to be easily drained into a remote catch basin using a ball valve (Figure 6, Item 7).

**Oil Filter (Figure 6, Item 6).** The oil filter/oil cooler assembly is located at the rear of the intake side of the engine. It removes impurities from the engine lubricating oil utilizing a full-flow, spin-on, disposable oil filter (Figure 6, Item 6) cartridge.





**Figure 7. Systems Components — Right-Side.**

### Unit Cooling System

**Cooling Fans (Figure 8, Item 6).** The three cooling fans allow the generator set to operate in all required operational environments. The 16-in, variable-speed 24-VDC cooling fans optimize radiator location and air flow paths for improved cooling efficiency. Intake air for the cooling system is drawn by the cooling fans through three fan shrouds and inlet ducts on the left-side body panel. This air passes through the cooling fins of the radiator, charge air cooler, and fuel cooler, transferring heat from the cooling system to the air flow. The warm air is then expelled into the atmosphere through a grille in the top body panel. The cooling system also reduces wear on the battery-charging alternator belt and water pump. Cold weather operation is also improved by regulating cabinet temperature at or near ideal operating temperatures.

**Coolant Circulation System.** This system consists of the radiator, charge air cooler, fuel cooler, thermostat, water pump, winterization kit, and coolant overflow reservoir. It is responsible for keeping the engine at a safe temperature. See TM 9-6115-752-10 for further information on maintaining the cooling system.

**Coolant Overflow Bottle (Figure 7, Item 1).** Mounted to the rear body panel at the fuel fill opening, the coolant overflow bottle is clearly visible for inspection of coolant level. It provides easy access for coolant filling through the top body panel.

**Radiator (Figure 7, Item 3).** An aluminum radiator acts as a heat exchanger for the engine coolant. A radiator fill port is accessible on the top body panel. The captive radiator cap prevents loss of coolant.

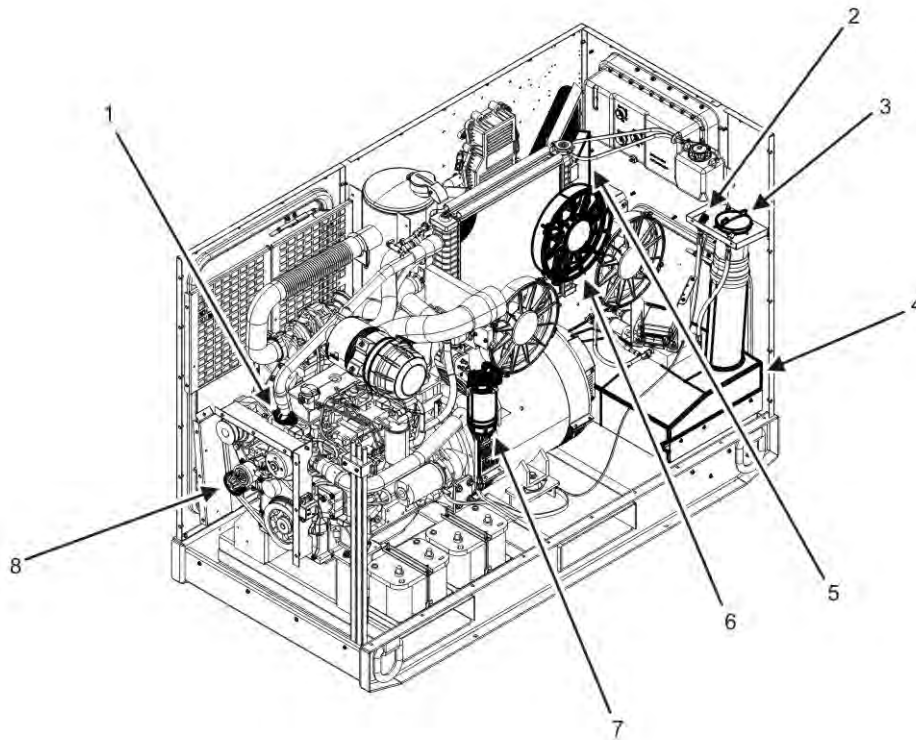
**Charge Air Cooler (Figure 7, Item 2).** Co-located with the radiator (Figure 7, Item 3), the charge air cooler dissipates the heat from the compressed air exiting the turbocharger into the air flow. The cooling of the intake air improves the efficiency of the engine.

**Fuel Cooler (Figure 8, Item 5).** A fuel cooler is located behind the charge air cooler (Figure 7, Item 2). The fuel cooler is not visible unless the top body panel is removed. Cooling of the fuel prior to injection into the engine improves the efficiency of the engine.

**Thermostat (Figure 8, Item 1).** A thermostat is located inside the housing where the upper radiator hose connects to the top of the engine. It monitors coolant temperature and adjusts the cooling system accordingly.

**Water Pump (Figure 8, Item 8).** The water pump circulates the coolant through the block assembly and the radiator.

**Winterization Kit (Figure 7, Item 6).** The optional winterization kit is located on the inside of the right-side body panel. The fuel-fired coolant heater warms coolant in extreme cold conditions between negative (-) 25 degrees Fahrenheit (°F) and -50°F (-32 degrees Celsius (°C) and -46°C) by utilizing the fuel from the generator set. The winterization kit automatically activates, depending on the temperature, and features automatic heat regulation. It is controlled by the DCS, which provides the [READY TO CRANK] indicator when the heater has completed its cycle.



**Figure 8. Systems Components — Left-Side.**

**Air Cleaner Assembly (Figure 7, Item 4).** The air cleaner assembly, mounted on a bracket attached to the front and top body panels, filters contaminants from the air intake. The air cleaner assembly contains an integrated, centrifugal precleaner that removes most dust particles prior to entering the air cleaner element. These larger contaminants are easily ejected from the air cleaner assembly through a squeeze-type fitting. This extends filter life and reduces maintenance costs and downtime. The air cleaner assembly is fitted with an indicator to show when the filter capacity is exceeded. The filter element is replaceable (TM 9-6115-752-10).

### **Exhaust System**

The exhaust manifold (Figure 6, Item 1) is located on the exhaust side of the engine and is accessible through the left-side access door. As exhaust leaves the compression chamber, it is routed through the exhaust manifold (Figure 6, Item 1) into a single pipe, and then into the turbocharger (Figure 5, Item 3). The turbocharger uses exhaust gases to turn a turbine which compresses the intake air. The compressed intake air is directed to the cylinders through the intake manifold and improves the efficiency and power production of the engine. The exhaust gases exit the turbocharger through the muffler (Figure 7, Item 5). The bulkhead-mounted muffler (Figure

7, Item 5) silences the exhaust pulses from the engine and expels exhaust gases through the top body panel grille.

### Unit Fuel System

**Fuel Fill (Figure 8, Item 3) and Fuel Tank (Figure 8, Item 4).** The AMMPS 30 kW generator set is designed to utilize diesel fuel or an acceptable substitute (Grade Number (No.) 1-d and Grade No. 2-d fuels per A-A-52557) and include design adaptations to accommodate the usage of Jet Propulsion (JP)-8. The fuel fill is located on the rear body panel and allows refueling during operation (TM 9-6115-752-10). The fuel tank is mounted directly to the skid assembly behind the rear access door. They are designed for 8 hour (hr) of operation at 75 percent (%) load on JP-8 fuel with the generator set at a 15-degree angle. The tank drain extends down into the skid area below the rear body panel. The main fuel pump moves lower-pressure fuel from the fuel tank and sends it through an in-line fuel filter to the fuel filter/water separator (Figure 8, Item 7).

**Fuel Filter/Water Separator (Figure 8, Item 7).** The fuel filter/water separator element is spin-on and removes debris and water particles from fuel before it enters the engine. A water drain cock is on the bottom of the filter (TM 9-6115-752-10).

**External Fuel Tank and Auxiliary Connections (Figure 8, Item 2).** Connections for auxiliary fuel supply and return are located in the fuel filler shroud. The auxiliary fuel pump transfers fuel from the auxiliary fuel tank to the unit fuel tank.

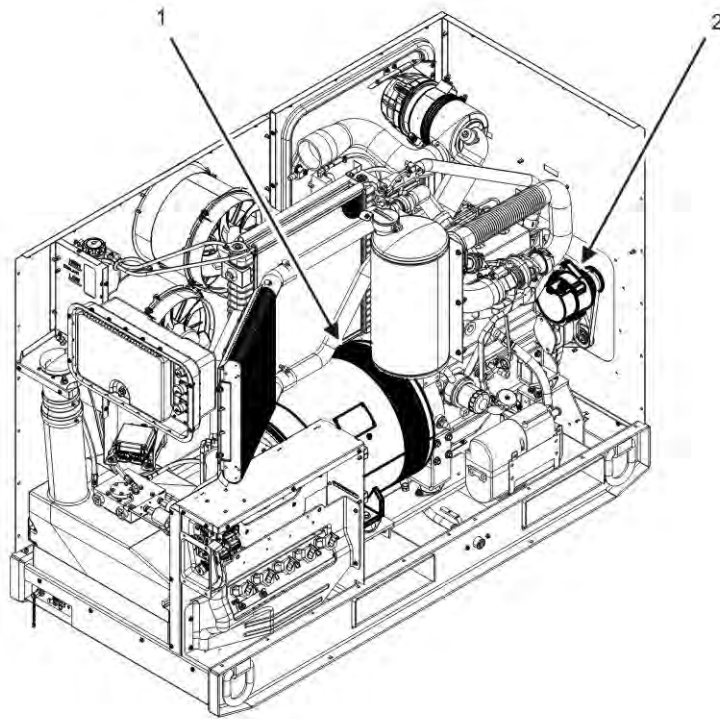


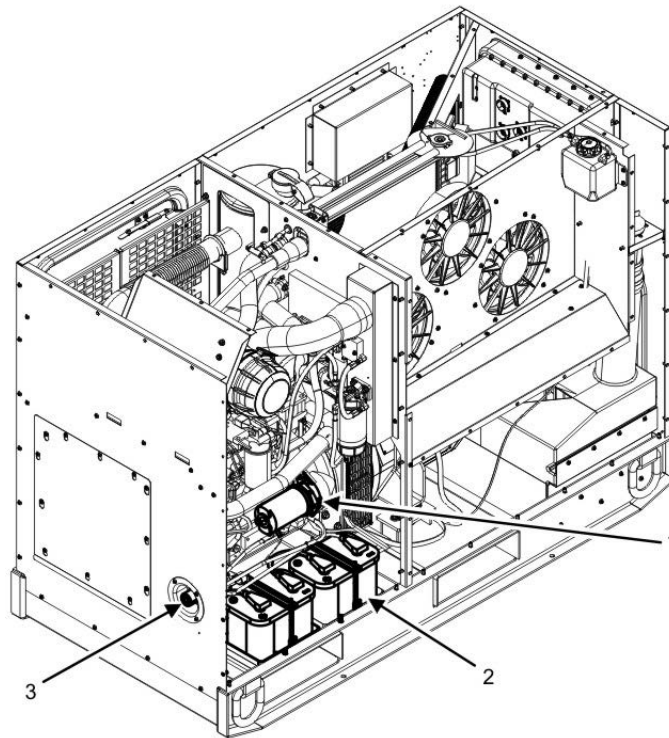
Figure 9. 24-VDC Electrical and AC Generator Components — Right Side.

### 24-VDC Electrical System

The 24-VDC electrical system uses two 12-volt (V) batteries (Figure 10, Item 3) connected in series. The batteries are standard commercial size, sealed, maintenance free, and located side-by-side on the left side of the unit. They are accessed through the left-side door. The batteries are capable of starting the generator set under all conditions between negative (-) 50°F (-46°C) and positive (+) 135°F (57°C) ambient temperatures. The starter (Figure 10, Item 2) is located on the exhaust side of the engine above the oil pan. A NATO slave receptacle

(Figure 10, Item 1) is provided should the unit require jump-starting from another 24-VDC source. In the event the engine needs to be manually turned, a three-position DEAD CRANK SWITCH is included (TM 9-6115-752-10). The 24-VDC system is protected by a 50-Ampere (Amp) main DC circuit breaker (Figure 12, Item 4). The main DC circuit breaker is accessed through the left-side door.

If the temperature is between +21°F and -25°F (-6°C and -32°C), intake air heaters are used to aid in starting. For temperatures between -25°F and -50°F (-32°C and -46°C), the optional winterization kit (Figure 7, Item 6) is used as an engine starting aid. See TM 9-6115-752-10 for more information.



**Figure 10. 24-VDC Electrical and AC Generator — Left Side.**

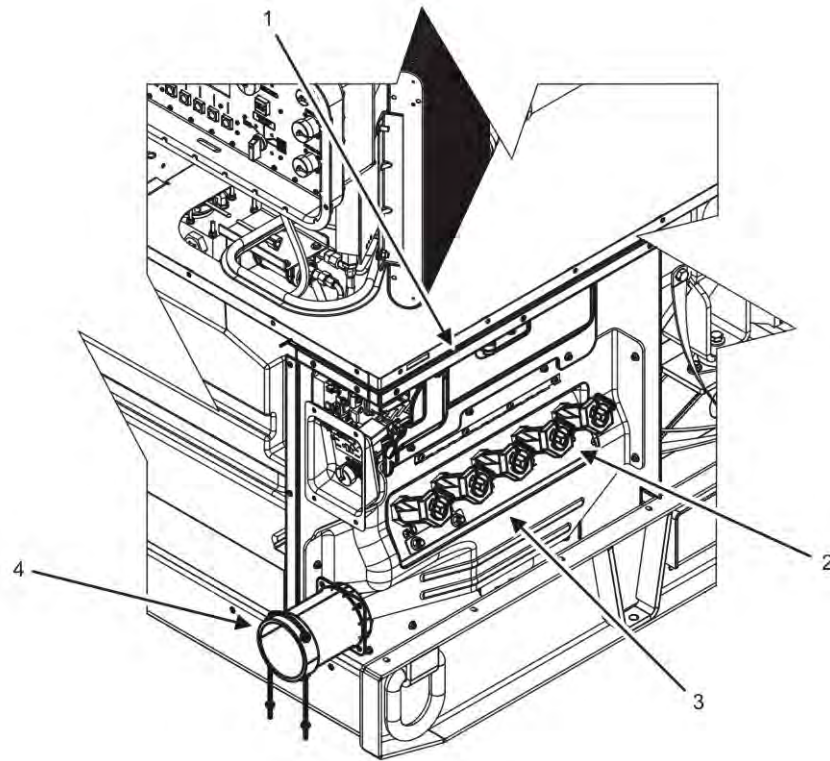
**Belt-Driven Battery-Charging Alternator (Figure 9, Item 2).** The standard belt-driven battery-charging alternator recharges the batteries which in turn provide power to the cooling fan, DCS, and engine systems. The charging system completely charges the batteries during operation within 4 hr of startup. A voltage regulator (internal to the alternator) controls the voltage output of the belt-driven battery-charging alternator.

#### **AC GENERATOR (Figure 9, Item 1)**

The AC generator converts the rotating mechanical energy from the engine into electrical energy. The electrical energy is then distributed from the output box assembly (Figure 11, Item 1) through cables which enter the output box assembly (Figure 11, Item 1) via a flexible sleeve (Figure 11, Item 4) from field equipment requiring electric power or a switch box.

The AC generator and voltage control system are drip-proof, guarded machine type and are synchronous and brushless, as specified in National Electrical Manufacturers Association (NEMA) Standard No. MG, part 33. The bearings are sealed and permanently lubricated. System leads are identified with permanent marker and are brought out of the frame through nonabrasive bushings and holders in the output terminal board (Figure 11, Item 3). These isolate each lead and hold it securely in place.

When operating in three-phase at rated load and frequency, the AC generator can withstand, without damage, two consecutive short circuits at the load terminals of 10 sec or less in duration within a 5-min interval at less than 300% of rated output current.



**Figure 11. Output Box Components — Right-Side.**

#### **OUTPUT BOX ASSEMBLY (Figure 11, Item 1)**

The output box assembly is located on the right-side body panel and distributes electricity produced by the AC generator through the output terminal board (Figure 11, Item 3). The output box contains the output terminal board, individual load terminals (Figure 11, Item 2), and unit relays. All relays are socket-mounted and secured with a cover. The relay will not move unless the cover is removed.

#### **DIFFERENCES BETWEEN MODELS**

The differences between models of generator sets covered in this TM are as follows:

Model MEP-1060 is equipped with a 50/60 Hz generator.

Model MEP-1061 is equipped with a 400 Hz generator.

**EQUIPMENT DATA**

For a list of leading particulars, refer to Table 1.

**Table 1. Equipment Data.**

<b>GENERATOR SET:</b> <b>Model Numbers:</b> 30 kW 50/60 Hz 30 kW 400 Hz <b>NSN:</b> 30 kW 50/60 Hz 30 kW 400 Hz <b>Overall Length:</b> MEP-1060 MEP-1061 <b>Overall Width:</b> MEP-1060 MEP-1061 <b>Overall Height:</b> MEP-1060 MEP-1061 <b>Dry Weights (less Bll):</b> MEP-1060 MEP-1061 <b>Wet Weights:</b> MEP-1060 MEP-1061	MEP-1060 MEP-1061  NSN 6115-01-561-7718 NSN 6115-01-561-7738  75 in (190.5 cm) 75 in (190.5 cm)  36 in (91.4 cm) 36 in (91.4 cm)  53 in (134.6 cm) 53 in (134.6 cm)  2600 lb (1179.34 kg) 2600 lb (1179.34 kg)  2730 lb (1238.30 kg) 2730 lb (1238.30 kg)
<b>Engine:</b> Manufacturer Model Type:  Displacement Altitude Degradation, 4000 – 8000 ft (1220 m – 2440 m) Firing Order Winterization Kit Use	Cummins QSB3.3 Tier III Direct Injection (DI), four cylinder, four cycle, vertical, water cooled 201.37 in <sup>3</sup> (3.3 L) 3.5% per 1000 ft (305 m)  1-2-4-3 -25°F to -50°F (-32°C to -46°C)
<b>Valve Tappet Clearance Adjustment</b> Intake Exhaust	0.014 in (0.35 mm) 0.020 in (0.50 mm)
<b>Cooling System:</b> Type Capacity Normal Operating Temperature Range Temperature Indicating System Voltage Rating	Pressurized radiator, forced circulation with pump 12.8 qt (12.11L) 185°F – 223°F (85°C – 106°C) 24VDC
<b>Lubrication System:</b> Type Oil Pump Type Normal Operating Pressure  Oil Filter Type Lubricating System Capacity Pressure Indicating System Voltage Rating	Forced lubrication by pump Gear driven 28 to 64 pounds per square inch (psi) (196 to 441 kiloPascal (kPa)) Spin-on cartridge 8.5 qt (8.0 L) 24 VDC

Table 1. Equipment Data — Continued.

<b>Fuel System:</b> Type of Fuel Fuel Tank Capacity Fuel Consumption Rate 50/60 Hz: 400 Hz:	DF-2D (ASTM D975) 16.7 gal (131.35 L) 3.30 Gallons Per Hour (GPH) (12.5 Liters per Hour (L/Hr)) 3.435 GPH (13.0 L/Hr)
<b>Auxiliary Fuel Pump:</b> Voltage Rating Delivery Pressure	24 VDC 6.3–9.7 psi (43.4–66.9 kPa)
<b>Fuel Level Sensor:</b> Type Current	Capacitive 20–200 milliampere (mA) at 10–32 VDC
<b>Starting System:</b> Batteries	2 X 12 VDC (52 AH) in series
<b>Starter:</b> Manufacturer Model Voltage Rating Drive Type	Denso 4948534 24 VDC Integral
<b>Battery-Charging Alternator:</b> Manufacturer Models Rating Protective Fuse	Nippondenso EE9339 60 Ampere (Amp) None
<b>AC Generator:</b> Manufacturer Type Load Capacity	Cummins CPG UC224D (50/60 Hz) and Marathon 30 kW (400 Hz) 30 kW
<b>Current Ratings:</b> 120/240 V connection 240/416 V connection Power Factor Cooling Drive Type Duty Classification	104 Amp 52 Amp 0.8 Fan cooled Direct coupling Continuous
<b>Protection Devices:</b> <b>Low Oil Pressure:</b> Trip Pressure Voltage Rating Current Rating	10 psi (145 kPa) 5 VDC 4 mA
<b>Coolant High Temperature:</b> Trip Temperature Voltage Rating Current Rating	223°F (106°C) 24 VDC 1 mA
<b>Overvoltage:</b> Trip Point Conditions Trip Point	Not more than 30% of rated voltage. No more than 1.25 sec after trip condition exists.

END OF WORK PACKAGE





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**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**THEORY OF OPERATION**

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## **SCOPE**

The AMMPS 30 kW generator set consists of two modes as follows:

MODES:        I – 50/60 Hz  
                  II – 400 Hz

The AMMPS 30 kW generator set was specifically designed for the best possible performance focusing on areas such as reliability, maintainability, weight, dimensions, and fuel consumption.

## **OPERATION**

The AMMPS 30 kW generator set is designed for deployment in the battlefield to provide personnel with the continuous power generation necessary for today's fielded electronic devices and various electrical equipment demands. The AMMPS 30 kW generator set is developed to be fixed (skid-mounted) or mobile (trailer-mounted) giving the flexibility of movement. The generator sets are designed to accommodate parallel operation of generator sets as well as additional and back-up power generation.

The housing assembly serves as the protective shell for the generator set. The housing has been designed with openings for ease of maintenance and additional acoustical protection to further silence the generator set while operating. The AMMPS 30 kW generator set has enhancements for protection from unusual/harsh weather and to shield from debris.

The AMMPS 30 kW generator set is powered by a turbocharged Cummins QSB3.3 Tier III 201.37 in<sup>3</sup> (3.3 L) DI diesel engine mounted directly to the skid assembly. This particular engine has a built-in Close Crankcase Ventilation (CCV) system. The engine produces mechanical energy and interconnects with the AC generator via a rotating shaft.

The AC generator is a Cummins Power Generation (CPG) UC224D (Mode I, Model 1060 (50/60 Hz)) or a Marathon 30 kW (Mode II, Model 1061 (400 Hz)). It is a synchronous, brushless design with a permanent magnet and was developed specifically to meet performance requirements. The AC generator receives mechanical energy from the engine and converts it to electrical energy. The electricity produced by the AC generator is transmitted to the output terminal board.

## **DCS**

The DCS uses a menu-driven display format to control generator set operations. From the DCS, the operator and/or maintainer can start the generator set, adjust the output voltage and frequency (Model 1070, Mode I only), operate the contactor, stop the AC generator, clear faults, and perform other functions necessary to produce power (Figure 1). The AMMPS 30 kW generator set also provides limited remote operation capabilities through interface with an IBM-compatible PC. The operational status of the generator set can be monitored, battleshort conditions can be set and released, and emergency stop can be executed from up to a 250-ft (76.2-m) distance.

The AMMPS 30 kW generator set is capable of self-diagnostics at start up. This prognostics function monitors the protective system and will provide a warning of impending activation of protective devices. All operational data is captured every 15 min during operation. Faults and warnings are automatically captured upon operation of protective devices and stored in a Fault Log. Additionally, all maintenance prompts and actions are automatically captured and stored in a Maintenance Log.

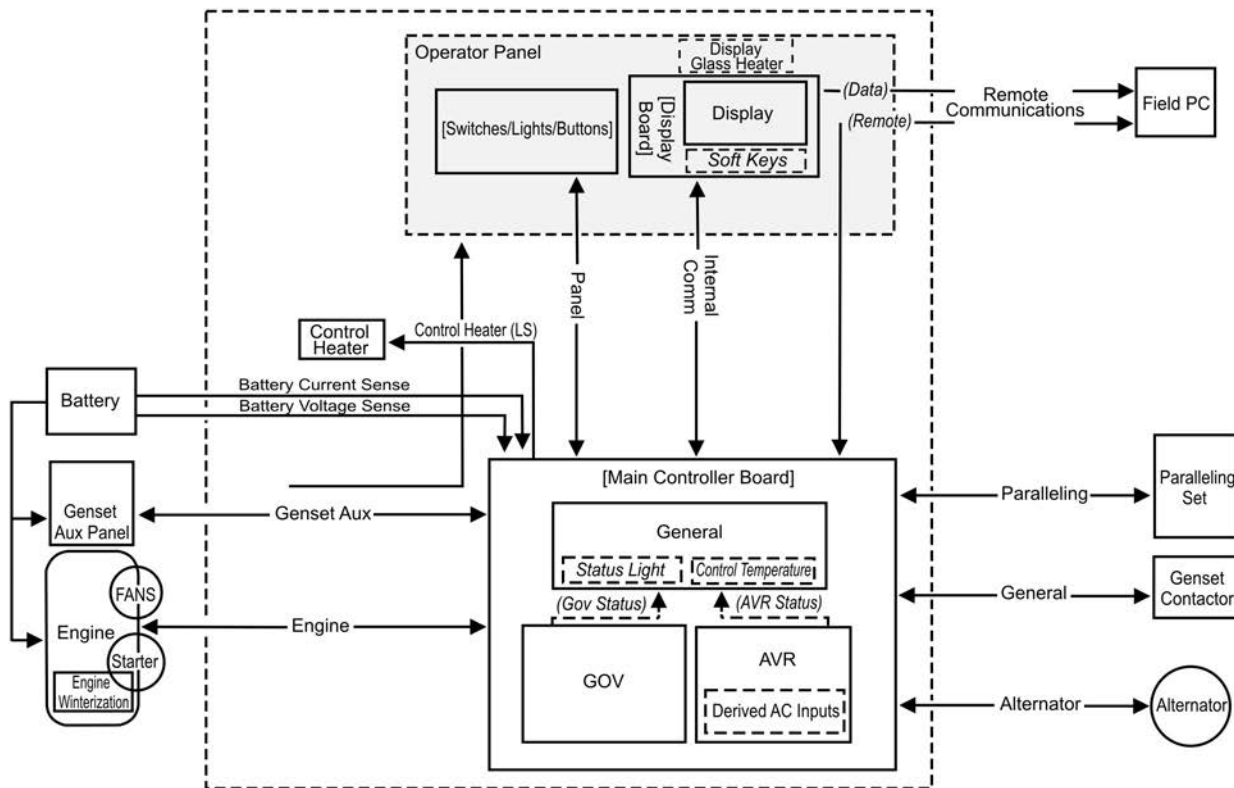


Figure 1. AMMPS Control Overview.

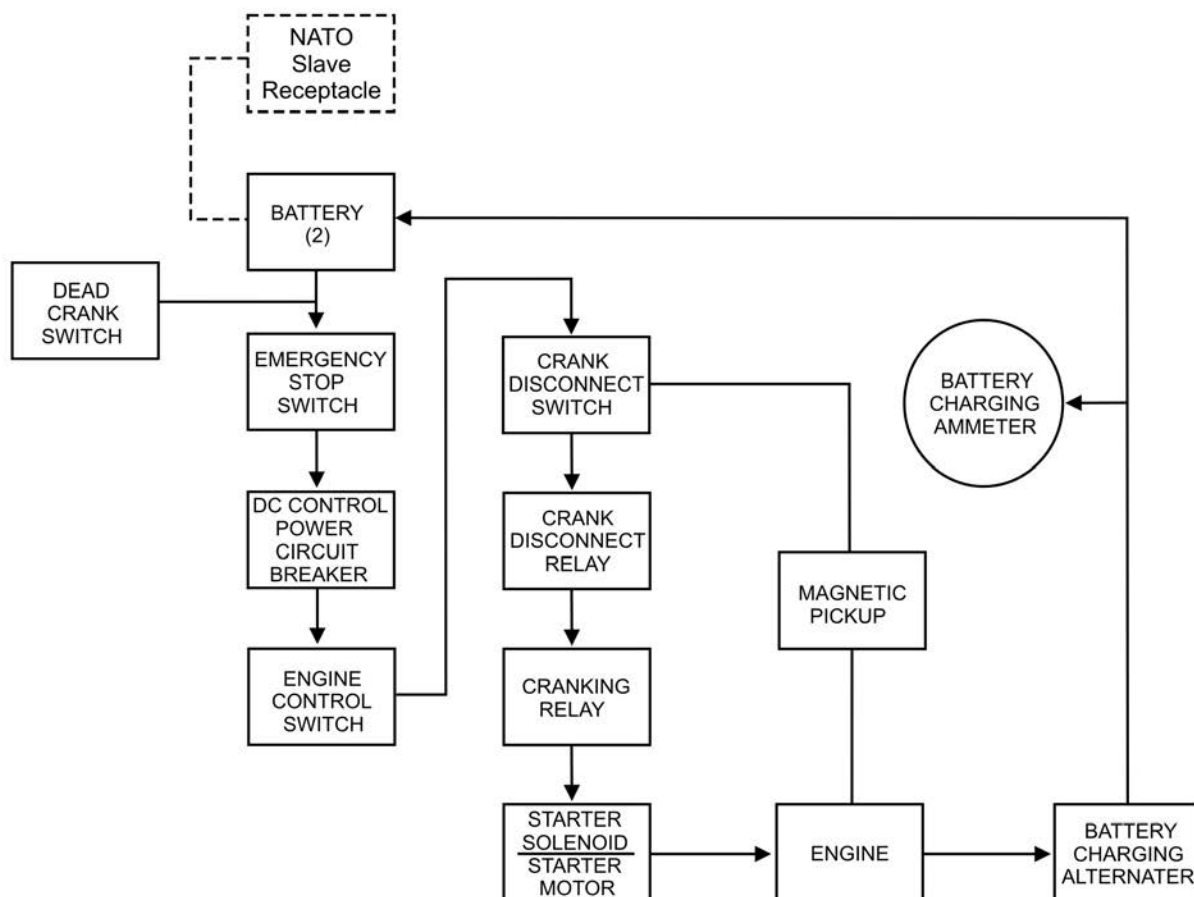
## TECHNICAL PRINCIPLES OF OPERATION

### Engine Starting System (Figure 2)

The engine starting system consists of two 12-V batteries connected in series to produce 24 V of electric power, a starter, a 24-V battery-charging alternator, a magnetic pickup (for sensing engine speed), and related switches and relays required for controlling the starting system (Figure 1). For engine cranking, battery power is supplied to the starter motor through the starter solenoid, which in turn is controlled by the cranking relay. The starter then engages the engine flywheel, causing the engine to turn over. For engine starting, the DEAD CRANK SWITCH must be in the NORMAL position, the main DC circuit breaker must be in the ON position, the EMERGENCY STOP switch must be pulled out, and the engine control switch must be moved to the START position. The cranking relay is then controlled by a circuit, consisting of the crank disconnect relay and crank disconnect switch. As the engine accelerates to the preset speed (sensed by the magnetic pickup), the crank disconnect switch opens and de-energizes the cranking relay to stop and disengage the starter. The starting sequence may also be stopped by moving the engine control switch to OFF. The engine may be cranked without starting by use of the DEAD CRANK SWITCH. With the DEAD CRANK SWITCH in the CRANK position, the cranking relay, starter solenoid, and starter motor are energized without activating any other starting or control functions. In the event the batteries become discharged, an alternative source of starting power is provided through the NATO slave receptacle.

The batteries are charged by the battery-charging alternator, which is belt-driven by the engine. The DCS is powered by the battery-charging alternator when the engine is operating and by the 24-V batteries at start up. Shown on the DCS display, the [Battery] charge ammeter indicates the charge/discharge rate of the batteries (from -80 Amps to +80 Amps, in 0.1 Amp increments). Normal operating indication depends on the state of charge in the batteries. A low charge, such as exists immediately after engine starting, will cause a high reading

(needle moves toward [+] area). When the charge in the batteries has been restored, the indicator moves toward zero.

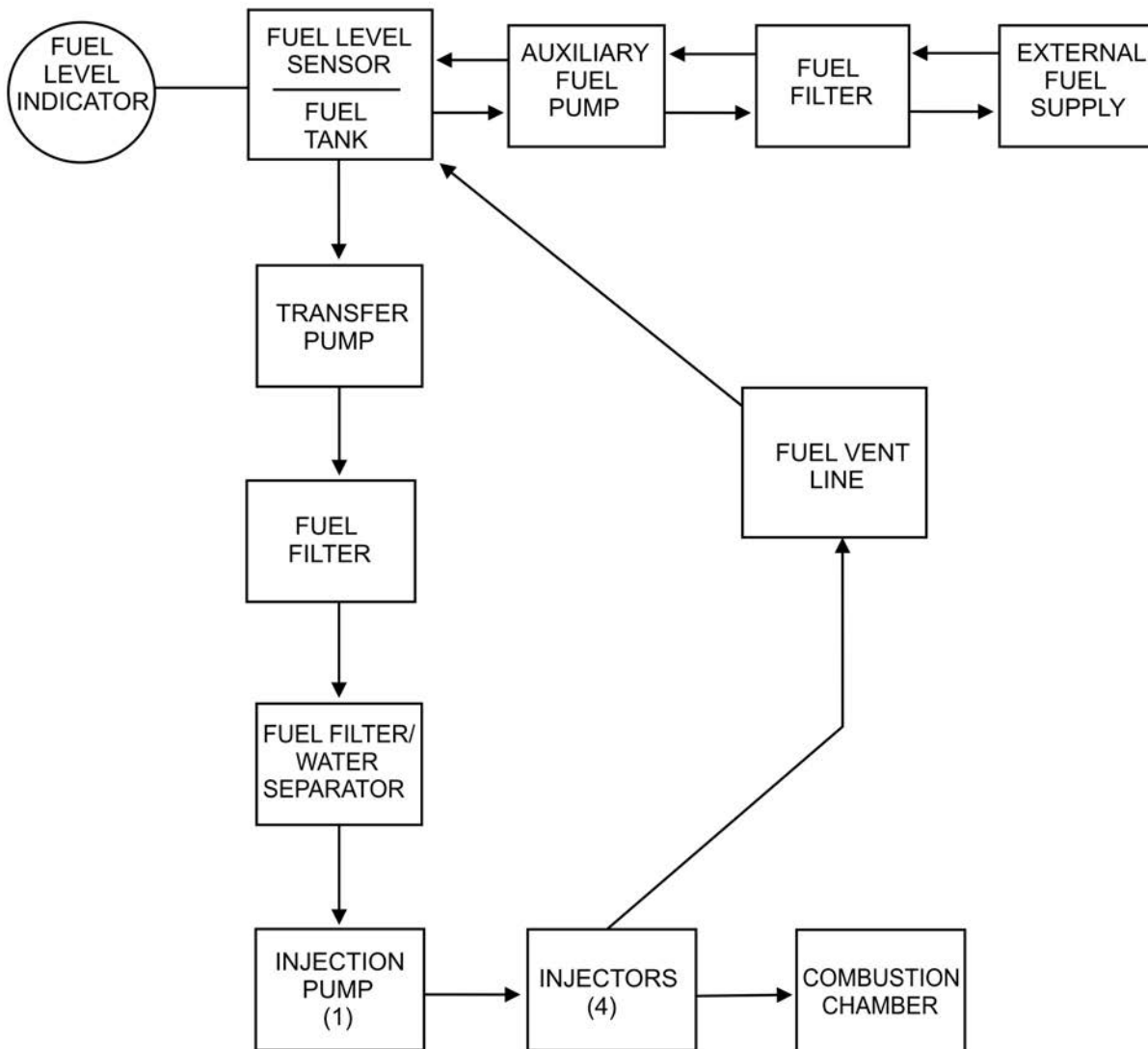


**Figure 2. Engine Starting System.**

### Fuel System (Figure 3)

The fuel system consists of piping, fuel tank, fuel filter, 24-VDC fuel pump, fuel filter/water separator, fuel level sensor, fuel injection pump, and four fuel injectors (one for each cylinder). Fuel is drawn from the fuel tank by the transfer pump when the engine control switch is in the PRIME & RUN position. After reaching the transfer pump, fuel passes through a fuel filter/water separator where water and small impurities are removed. The fuel then goes to the injection pumps where it is pressurized and forced into the injectors. Through the injectors, fuel is sprayed into the combustion chamber at high pressure, where it is mixed with air and ignited. The fuel that is not used is returned to the fuel tank via an excess fuel return line.

The auxiliary fuel system consists of an external fuel supply, fuel filter pipe, 24-VDC auxiliary fuel pump, and fuel level switch. The engine control switch, when set to PRIME & RUN AUX FUEL, actuates the auxiliary fuel pump and transfers fuel from the external fuel supply to the generator fuel tank. The fuel level switch shuts off the auxiliary fuel pump when the generator fuel tank is full and reactivates the pump as the level drops to 75%. The [Fuel] indicator on the DCS displays the fuel level of the generator fuel tank from empty [0] to full [100] in 1% increments.



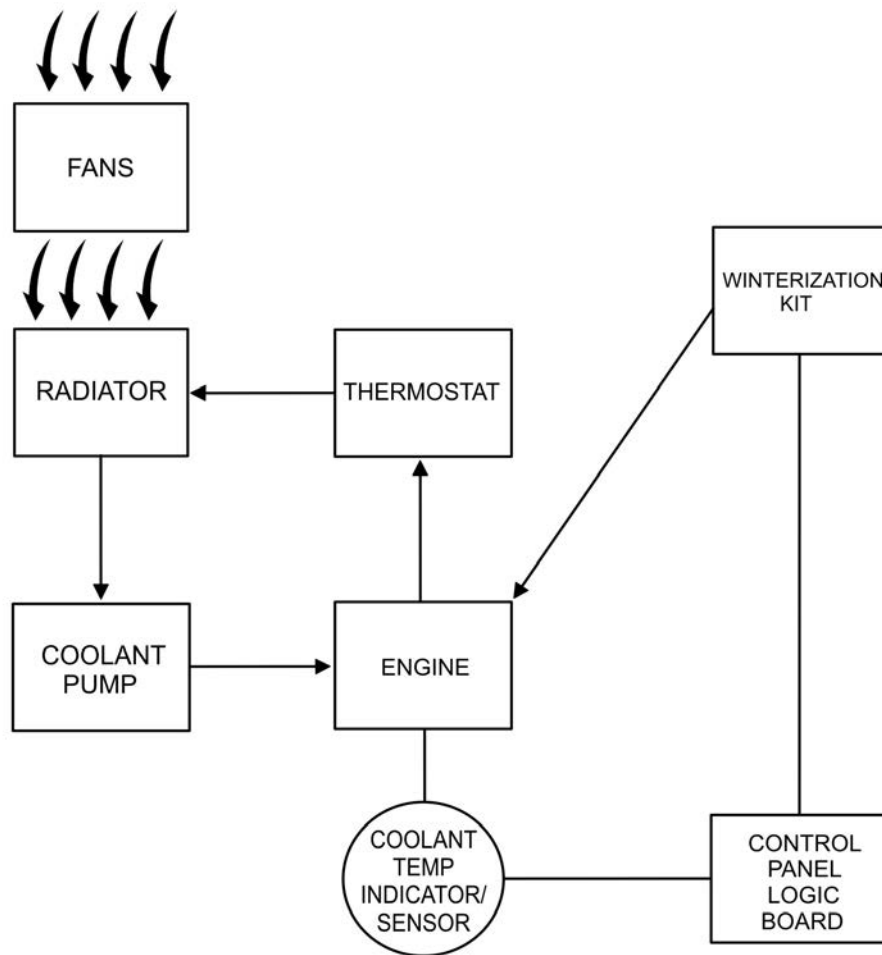
**Figure 3. Fuel System.**

#### **Engine Cooling System (Figure 4)**

The engine cooling system consists of a radiator, hoses, thermostat, water pump, electric fan, temperature sensor, and cooling jackets. The water pump forces coolant through passages (cooling jackets) in the engine block and cylinder head where the coolant absorbs heat from the engine. When the engine reaches normal operating temperature, the thermostat opens and the heated coolant flows through the upper radiator hose assembly into the radiator. Air circulates through the radiator, reducing coolant temperature.

A coolant high-temperature logic control provides automatic shutdown in the event that coolant temperature exceeds 225 plus or minus ( $\pm$ ) 5°F ( $107 \pm 3^\circ\text{C}$ ). The [Coolant] indicator on the DCS displays coolant temperature range from 100°F to 260°F ( $38^\circ\text{C}$  to  $127^\circ\text{C}$ ).

Cold outside temperatures make starting the engine difficult. To improve engine starting, the generator set has two starting aids: standard air intake heaters mounted in the intake manifold and an optional winterization kit. The air intake heaters warm the air in the combustion chamber to assist with ignition when the ambient air temperature is below +20°F ( $-6^\circ\text{C}$ ). The winterization kit warms the engine coolant and thus the engine block when the ambient air temperature is between -25°F ( $-32^\circ\text{C}$ ) and -50°F ( $-45.56^\circ\text{C}$ ).

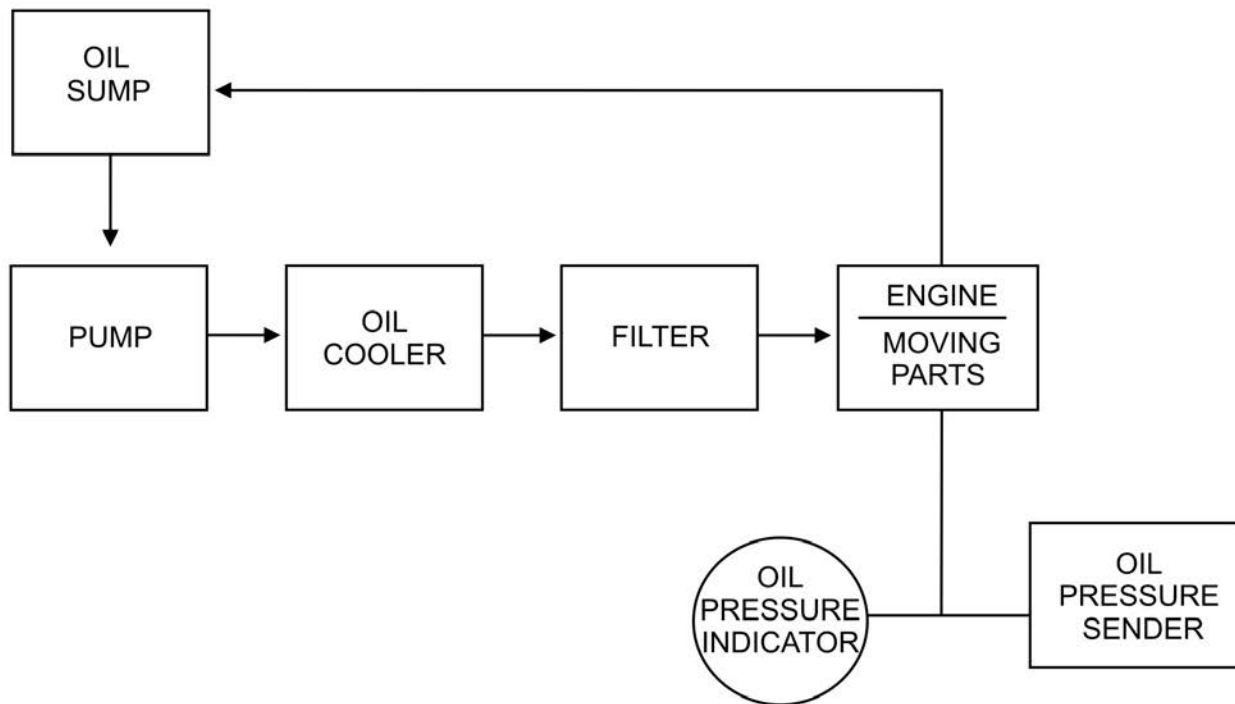


**Figure 4. Engine Cooling System.**

#### **Lubrication System (Figure 5)**

The lubrication system consists of an oil pan, dipstick, oil pump, oil pressure sensor, oil screen, oil cooler and oil filter. The oil pan is a reservoir for engine lubricating oil. The dipstick indicates oil level in the pan. A pump draws oil from the pan through a screen removing large impurities. After passing through an oil cooler the oil passes through a spin-on type filter where small impurities are removed. From the filter, oil enters the engine and is distributed to the engine's internal moving parts.

After passing through the engine, the oil returns to the oil pan. The [Oil] pressure indicator on the DCS shows oil pressure sensed by the oil pressure sensor in the engine. The engine automatically shuts off if oil pressure drops to a dangerously low level (in the red area of the DCS oil pressure gage). It is recommended to check the engine oil when the engine is not operating, but it can be checked while the engine is operating (TM 9-6115-752-10).



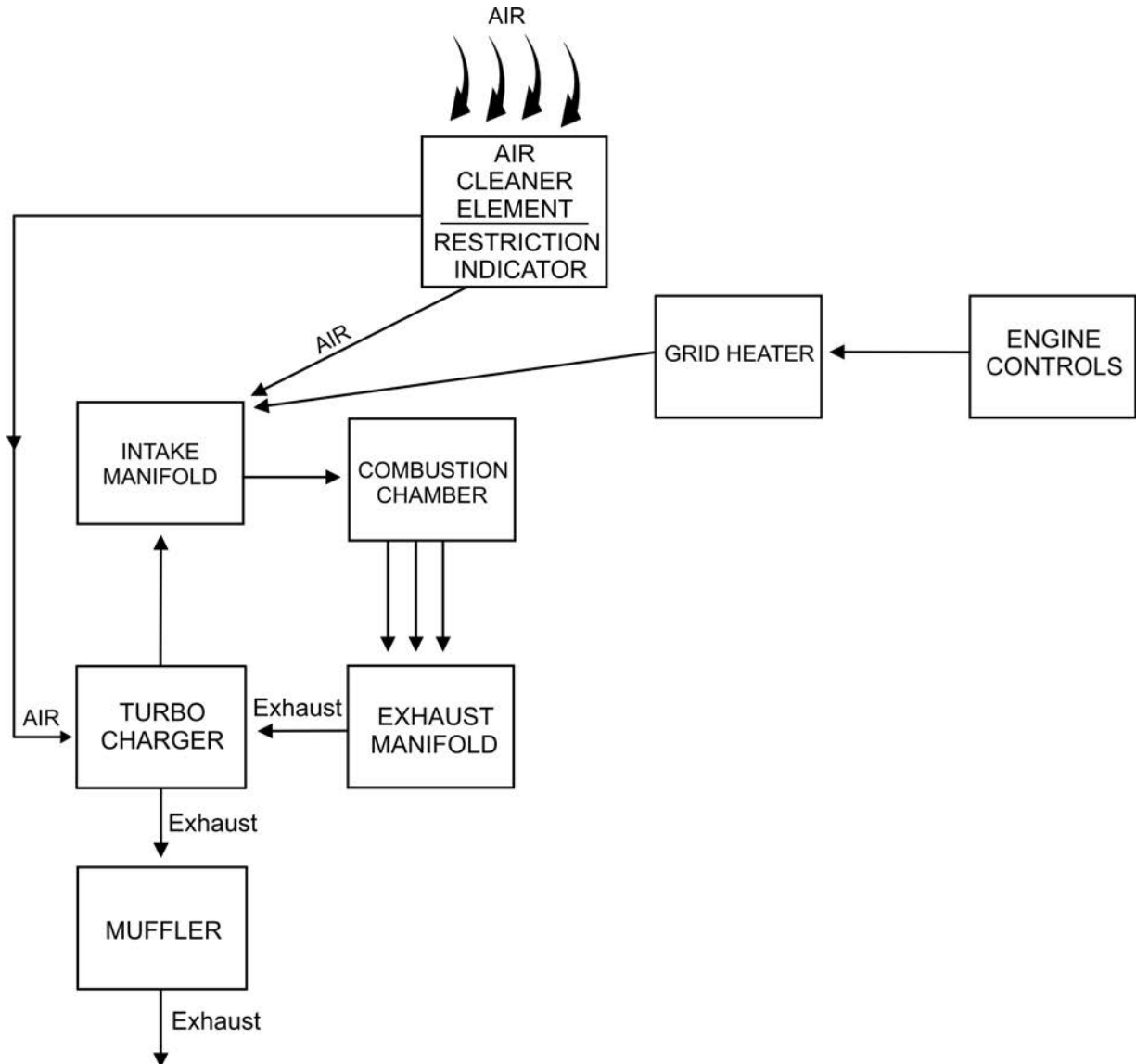
**Figure 5. Engine Lubrication System.**

#### **Air Intake and Exhaust System (Figure 6)**

The air intake and exhaust system consists of an air cleaner assembly, intake manifold, exhaust manifold, turbocharger, and muffler. Ambient air is drawn into the air cleaner assembly where it passes through the air cleaner element.

Airborne dirt is removed and trapped in the element. A restriction indicator, located on the air cleaner assembly housing, displays red when the air cleaner element should be serviced. Filtered air is drawn out of the air cleaner assembly into the inlet portion of the turbocharger. The air exits the turbocharger through an additional air intake tube into the air intake manifold, where it passes into the engine and is mixed with fuel from the injectors.

Engine exhaust gases are expelled into the exhaust manifold. The exhaust manifold channels the gases into the turbocharger which then compresses the air from the air filter and forces the air into the intake manifold. The exhaust gases then pass to the muffler to deaden the sound of the exhaust gases. The gases pass from the muffler outlet and are vented upward from the generator set housing.



**Figure 6. Air Intake and Exhaust System.**

### **Output Supply System (Figure 7)**

The output supply system consists of the AC generator, output terminal board, voltage selection board, Automatic Voltage Regulator (AVR), Ampere Meter – Voltage Meter (AM – VM), AC circuit interrupt relay, and contactor. Power created by the generator is supplied through the voltage selection board and the AC circuit contactor to the output terminals on the output terminal board. For more information on the theory and practice of electrical generation, refer to FM 5-424, Theater of Operations Electrical Systems.

The voltage selection board allows configuration of the generator set for the following voltage ranges:

120/208V, 3 phase, 4 wire

240/416V, 3 phase, 4 wire

The AC CIRCUIT INTERRUPT switch controls the AC circuit interrupter relay. The relay enables or interrupts the power flow between the voltage selection board and the output terminals by opening and closing the contactor. The AC circuit interrupter relay also automatically opens the contactor during any of the faults that require a

shutdown. The AVR senses AC voltage output and provides controlled voltage to the AC generator exciter to maintain the desired AC generator output voltage. [Voltage] and [Current] are indicated on the operator control screen on the DCS. The [Genset Voltage] panel on the DCS displays the [Voltage] AC output of the unit. The [Bus Voltage] panel on the DCS displays the [Voltage] AC output at the output terminal board. The [Genset Current] screen on the DCS displays the output of the unit in amperes.

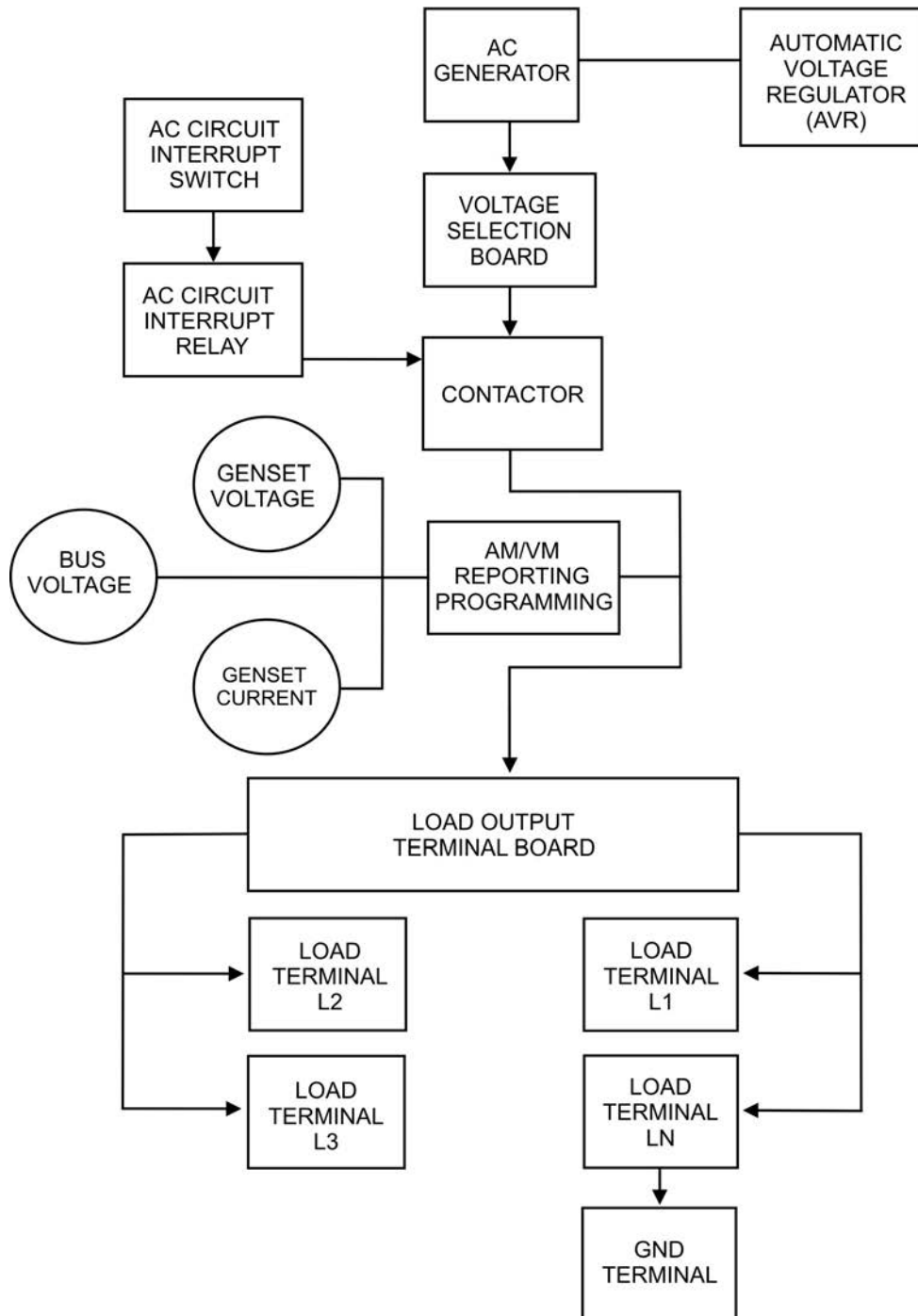


Figure 7. Output Supply System.

END OF WORK PACKAGE



**CHAPTER 2**

**FIELD TROUBLESHOOTING PROCEDURES**

**FOR**

**AMMPS 30KW GENERATOR SET**

## CHAPTER 2

### FIELD TROUBLESHOOTING PROCEDURES

#### WORK PACKAGE INDEX

<u>Title</u>	<u>WP Sequence No.</u>
TROUBLESHOOTING INDEX .....	0004
OPERATIONAL CHECKOUT .....	0005
WARNINGS AND FAULT CODES .....	0006
COOLING SYSTEM TROUBLESHOOTING WITH A DCS CODE .....	0007
ELECTRICAL SYSTEM TROUBLESHOOTING WITH A DCS CODE .....	0008
ELECTRICAL SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE .....	0009
ENGINE SYSTEM TROUBLESHOOTING WITH A DCS CODE .....	0010
ENGINE SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE .....	0011
EXHAUST SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE .....	0012
WINTERIZATION KIT TROUBLESHOOTING .....	0013

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**TROUBLESHOOTING INDEX**

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## **GENERAL TROUBLESHOOTING INFORMATION**

Troubleshooting procedures are designed to isolate AMMPS faults to the LRU level. Troubleshooting techniques apply to all AMMPS components as indicated.

Troubleshooting procedures list the symptoms, malfunctions, and corrective actions required to resolve the problem(s). Perform all steps in the order they appear in the WP. Troubleshooting procedures are listed according to symptom, followed by the malfunction, then any corrective action(s). All necessary references to procedures/instructions can be found within the applicable Troubleshooting WP (see the Malfunction/Symptom Index below).

The DCS constantly monitors the engine sensors for abnormal conditions, such as low oil pressure and high coolant temperature. If any of these conditions occur, the DCS control panel display screen will display a message indicating a fault or warning code. The system will shut down if a fault code is indicated. The system will not normally shut down from warning codes. If a warning is indicated but not addressed, it may become a fault. If a malfunction or failure occurs during an operation or performance check, perform troubleshooting IAW the Malfunction/Symptom Index and any displayed fault or warning codes (WP 0006, Warnings and Fault Codes). Troubleshooting is offered in two formats when necessary: a fault with a DCS code and a fault without a DCS code. Always check DCS screen for any fault or warning codes before performing troubleshooting procedures.

DO NOT BEGIN A TASK UNTIL:

- You understand the task.
- You have the tools and equipment you need.

## **MALFUNCTION/SYMPTOM INDEX**

The Malfunction/Symptom Index is a quick reference for locating troubleshooting procedures. Troubleshooting procedures are arranged based on the location of the malfunction (i.e., engine, exhaust system, cooling system) and presence of a DCS code.

### **DCS Fault/Warning Codes**

WP 0006 describes each fault and warning code with applicable reference. When applicable, there are two versions for each troubleshooting system WP: faults with a DCS code and faults without a DCS code.

### **Operational Checkout**

Field maintenance is responsible for performing operational checkout procedures (WP 0005, Operational Checkout) prior to determining generator set as operational or before detailed troubleshooting is attempted.

### **Indications from Manual Troubleshooting Techniques**

Field maintenance is responsible for performing manual troubleshooting techniques, including continuity tests and voltage checks.

## After Corrective Action

After the corrective action is completed, the equipment must be tested to verify that the problem is corrected. Locate the malfunction in the troubleshooting procedures and perform the test or inspection. If the correct response is not obtained, continue troubleshooting all suspected malfunctions and performing corresponding corrective actions until the equipment is operational or is replaced with operational equipment.

## Specific Troubleshooting Procedures

This TM cannot list all malfunctions that may occur or all tests or inspections and corrective actions. If the malfunction encountered is not listed or is not corrected by the listed corrective action, replace the lowest level LRU component that will remedy the malfunction.

### Malfunction/Symptom

### Troubleshooting Procedure WP and Page

## COOLING SYSTEM TROUBLESHOOTING WITH A DCS CODE

1.[Fault 151: High Coolant Temperature] displayed on DCS screen .....	WP 0007, Page 2
a. Low coolant level, improper type used, or clogged cooling fins in radiator .....	WP 0007, Page 2
b. Loose, defective, or improperly fitted radiator cap or coolant overflow bottle cap .....	WP 0007, Page 2
c. Coolant system leak .....	WP 0007, Page 3
d. Inoperable thermostat .....	WP 0007, Page 4
e. Inoperable cooling fan(s) .....	WP 0007, Page 4
f. Defective temperature sensor .....	WP 0007, Page 5
g. Generator set overload .....	WP 0007, Page 5
h. Excessive slack in battery-charging alternator belt .....	WP 0007, Page 5
i. Improperly operating water pump .....	WP 0007, Page 6
j. Insufficient cooling effect of radiator .....	WP 0007, Page 6
k. Low engine oil level .....	WP 0007, Page 6
l. Clogged muffler or clog in exhaust system .....	WP 0007, Page 7
m. Engine used at high temperatures or high altitude .....	WP 0007, Page 7
n. Improper fuel injection .....	WP 0007, Page 7
o. Internal engine problem .....	WP 0007, Page 7
2.[Warning 146: Pre-High Coolant Temperature] displayed on DCS screen .....	WP 0007, Page 7
Cooling system malfunction .....	WP 0007, Page 7

## ELECTRICAL SYSTEM TROUBLESHOOTING WITH A DCS CODE

3.[Fault 111: ECM Failure] displayed on DCS screen .....	WP 0008, Page 2
ECM internal failure .....	WP 0008, Page 2
4.[Fault 115: Speed Signal Lost] displayed on DCS screen .....	WP 0008, Page 3
Engine speed sensor(s) malfunction .....	WP 0008, Page 3

**Malfunction/Symptom****Troubleshooting Procedure WP and Page**

5.[Fault 342: Calibration Code Failure] displayed on DCS screen .....	WP 0008, Page 5
ECM conflict.....	WP 0008, Page 5
6.[Fault 781: CAN Data Link Failure] displayed on DCS screen .....	WP 0008, Page 5
ECM or DCS communication malfunction .....	WP 0008, Page 5
7.[Fault 1433: Local E-Stop] displayed on DCS screen.....	WP 0008, Page 6
Malfunctioning EMERGENCY STOP push button or malfunctioning DCS .....	WP 0008, Page 6
8.[Fault 1434: Remote E-Stop] displayed on DCS screen.....	WP 0008, Page 7
Defective remote operating cable, pins on DCS, or remote operating source .....	WP 0008, Page 7
9.[Fault 1445: Short Circuit] displayed on DCS screen .....	WP 0008, Page 7
Load cables have been shorted or overloaded .....	WP 0008, Page 7
10.[Fault 1446: High AC Voltage] displayed on DCS screen.....	WP 0008, Page 9
Incorrect setting or shorted load .....	WP 0008, Page 9
11.[Fault 1447: Low AC Voltage] displayed on DCS screen .....	WP 0008, Page 10
Overload, damage to wiring, or damage to DCS.....	WP 0008, Page 10
12.[Fault 1448: Underfrequency] displayed on DCS screen.....	WP 0008, Page 10
Generator set was subjected to a reduction in speed for a period of time .....	WP 0008, Page 10
13.[Fault 1452: Genset Contactor Fail To Close] displayed on DCS screen.....	WP 0008, Page 11
Contactor or wiring malfunction .....	WP 0008, Page 11
14.[Fault 1453: Genset Contactor Fail To Open] displayed on DCS screen .....	WP 0008, Page 12
Contactor or wiring malfunction .....	WP 0008, Page 12
15.[Fault 1472: High Current] displayed on DCS screen.....	WP 0008, Page 13
Short, overload, or AC generator malfunction .....	WP 0008, Page 13
16.[Fault 1257: Control Module ID Input State Failure] displayed on DCS screen.....	WP 0008, Page 14
ECM error or internal hardware failure .....	WP 0008, Page 14
17.[Fault 1918: Fuel Level Low] displayed on DCS screen.....	WP 0008, Page 15
Low fuel level or fuel level sensor malfunction .....	WP 0008, Page 15
18.[Fault 2335: Excitation Fault] displayed on DCS screen.....	WP 0008, Page 15
Circuit breaker, wiring, or AC generator malfunction.....	WP 0008, Page 15
19.[Fault 2914: Genset AC Meter Failed] displayed on DCS screen .....	WP 0008, Page 18
Generator set AC meter failure.....	WP 0008, Page 18
20.[Fault 2972: Field Overload] displayed on DCS screen.....	WP 0008, Page 18
Faulty alternator components or AVR .....	WP 0008, Page 18
21.[Fault 3664: Invalid Genset Configuration] displayed on DCS screen.....	WP 0008, Page 18
Incorrect dip switch settings, wiring malfunction, or improper engine or AC generator combination.....	WP 0008, Page 18

<b><u>Malfunction/Symptom</u></b>	<b><u>Troubleshooting Procedure WP and Page</u></b>
22.[Fault 3665: Invalid Voltage Configuration] displayed on DCS screen .....	WP 0008, Page 19
Voltage selection fault.....	WP 0008, Page 19
23.[Fault 3668: Output Voltage Configuration Bit 0 Changed] or [Fault 3669: Output Voltage Configuration Bit 1 Changed] displayed on DCS screen .....	WP 0008, Page 20
Voltage selection fault.....	WP 0008, Page 20
24.[Fault 3673: Convenience Receptacle AC Meter Failed] displayed on DCS screen .....	WP 0008, Page 20
Convenience receptacle AC meter failed .....	WP 0008, Page 20
25.[Fault 3677: Genset Config Factory Test Fault] displayed on DCS screen .....	WP 0008, Page 21
Factory calibration error.....	WP 0008, Page 21
26.[Warning 121: Speed Signal Error] displayed on DCS screen .....	WP 0008, Page 21
Camshaft or crankshaft speed sensor problem.....	WP 0008, Page 21
27.[Warning 122: Intake Manifold Pressure Sensor High] displayed on DCS screen .....	WP 0008, Page 21
Voltage above normal or shorted to a high source.....	WP 0008, Page 21
28.[Warning 123: Intake Manifold Pressure Sensor Low] displayed on DCS screen.....	WP 0008, Page 23
Voltage below normal or shorted to a low source .....	WP 0008, Page 23
29.[Warning 135: Oil Pressure Sensor High] displayed on DCS screen .....	WP 0008, Page 23
Voltage above normal or shorted to a high source.....	WP 0008, Page 23
30.[Warning 141: Oil Pressure Sensor Low] displayed on DCS screen.....	WP 0008, Page 24
Voltage below normal or shorted to a low source .....	WP 0008, Page 24
31.[Warning 144: Coolant Temp Sensor OOR High] displayed on DCS screen .....	WP 0008, Page 25
Defective temperature sensor or wiring.....	WP 0008, Page 25
32.[Warning 145: Coolant Temp Sensor OOR Low] displayed on DCS screen.....	WP 0008, Page 26
Defective temperature sensor or wiring.....	WP 0008, Page 26
33.[Warning 153: Intake Manifold Temperature Sensor High] displayed on DCS screen.....	WP 0008, Page 27
Defective temperature sensor or wiring.....	WP 0008, Page 27
34.[Warning 154: Intake Manifold Temperature Sensor Low] displayed on DCS screen .....	WP 0008, Page 28
Defective temperature sensor or wiring.....	WP 0008, Page 29
35.[Warning 221: Ambient Air Pressure Sensor High] displayed on DCS screen.....	WP 0008, Page 29
Defective ambient air sensor or wiring .....	WP 0008, Page 29
36.[Warning 222: Air Pressure Sensor Low] displayed on DCS screen.....	WP 0008, Page 30
Defective ambient air sensor or wiring .....	WP 0008, Page 30
37.[Warning 238: Sensor Supply 3 Low] displayed on DCS screen.....	WP 0008, Page 30
Defective engine speed sensor, wiring, or ECM .....	WP 0008, Page 30
38.[Warning 239: Sensor Supply 3 High] displayed on DCS screen.....	WP 0008, Page 32
Defective engine speed sensor, wiring, or ECM .....	WP 0008, Page 32

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39.[Warning 271: Fuel Pressure Solenoid Valve Low] displayed on DCS screen.....	WP 0008, Page 32
Defective fuel pump actuator, wiring, or ECM .....	WP 0008, Page 32
40.[Warning 272: Fuel Pressure Solenoid Valve High] displayed on DCS screen.....	WP 0008, Page 34
Electrical or communication error .....	WP 0008, Page 34
41.[Warning 285: CAN Multiplex PGN Rate Error] displayed on DCS screen .....	WP 0008, Page 35
ECM or DCS communication malfunction .....	WP 0008, Page 35
42.[Warning 286: CAN Multiplex Calibration Error] displayed on DCS screen.....	WP 0008, Page 35
ECM or DCS communication malfunction .....	WP 0008, Page 35
43.[Warning 295: Ambient Air Pressure Sensor Error] displayed on DCS screen .....	WP 0008, Page 35
Defective ambient air sensor or wiring .....	WP 0008, Page 35
44.[Warning 322: Injector Solenoid 1 Low Current] displayed on DCS screen .....	WP 0008, Page 36
Below normal current or open circuit .....	WP 0008, Page 36
45.[Warning 319: Real Time Clock Error] displayed on DCS screen .....	WP 0008, Page 37
Clock no longer accurate due to temporary power loss or backup battery failure .....	WP 0008, Page 37
46.[Warning 324: Injector Solenoid 3 Low Current] displayed on DCS screen .....	WP 0008, Page 38
Below normal current or open circuit .....	WP 0008, Page 38
47.[Warning 331: Injector Solenoid 2 Low Current] displayed on DCS screen .....	WP 0008, Page 38
Below normal current or open circuit .....	WP 0008, Page 38
48.[Warning 332: Injector Solenoid 4 Low Current] displayed on DCS screen .....	WP 0008, Page 38
Below normal current or open circuit .....	WP 0008, Page 38
49.[Warning 343: ECM Hardware Failure] .....	WP 0008, Page 38
ECM internal failure .....	WP 0008, Page 38
50.[Warning 351: Injector Power Supply Failure] displayed on DCS screen.....	WP 0008, Page 38
Battery power not available to energize power supply .....	WP 0008, Page 38
51.[Warning 352: Sensor Supply 1 Low] displayed on DCS screen.....	WP 0008, Page 39
Defective ECM sensor(s), wiring, or ECM .....	WP 0008, Page 39
52.[Warning 386: Sensor Supply 1 High] displayed on DCS screen .....	WP 0008, Page 39
Defective ECM sensor(s), wiring, or ECM .....	WP 0008, Page 39
53.[Warning 427: CAN Data Link Degraded] displayed on DCS screen .....	WP 0008, Page 41
ECM or DSC communication malfunction .....	WP 0008, Page 41
54.[Warning 435: Oil Pressure Switch Error] displayed on DCS screen .....	WP 0008, Page 41
Oil pressure switch or wiring error .....	WP 0008, Page 41
55.[Warning 441: Low Battery Voltage] displayed on DCS screen.....	WP 0008, Page 42
Battery or charging failure .....	WP 0008, Page 42

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56.[Warning 442: High Battery Voltage] displayed on DCS screen.....	WP 0008, Page 42
Alternator or DCS failure .....	WP 0008, Page 42
57.[Warning 451: Injector Metering Rail 1 Pressure: High Voltage] displayed on DCS screen ....	WP 0008, Page 42
Wiring, sensor, or ECM malfunction .....	WP 0008, Page 42
58.[Warning 452: Injector Metering Rail 1 Pressure: Low Voltage] displayed on DCS screen .....	WP 0008, Page 44
Wiring, sensor, or ECM malfunction .....	WP 0008, Page 44
59.[Warning 496: Speed Sensor Supply Voltage Error] displayed on DCS screen.....	WP 0008, Page 44
Camshaft position sensor error .....	WP 0008, Page 44
60.[Warning 554: APC Pressure Error] displayed on DCS screen .....	WP 0008, Page 45
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61.[Warning 689: Crankshaft Speed Error] displayed on DCS screen .....	WP 0008, Page 45
Crankshaft engine speed sensor error .....	WP 0008, Page 45
62.[Warning 697: ECM Temp High] displayed on DCS screen .....	WP 0008, Page 45
ECM internal failure .....	WP 0008, Page 45
63.[Warning 698: ECM Temp Low] displayed on DCS screen .....	WP 0008, Page 46
ECM internal failure .....	WP 0008, Page 46
64.[Warning 757: ECM Data Lost] displayed on DCS screen .....	WP 0008, Page 46
ECM power supply malfunction .....	WP 0008, Page 46
65.[Warning 782: CAN Data Link Failure] displayed on DCS screen .....	WP 0008, Page 46
CAN data link malfunction .....	WP 0008, Page 46
66.[Warning 1117: Power Lost With Ignition On] displayed on DCS screen .....	WP 0008, Page 47
Power supply malfunction.....	WP 0008, Page 47
67.[Warning 1131: Battle Short Active] displayed on DCS screen .....	WP 0008, Page 48
BATTLESHORT switch malfunction .....	WP 0008, Page 48
68.[Warning 1376: Camshaft Speed Error] displayed on DCS screen.....	WP 0008, Page 49
Camshaft position sensor error .....	WP 0008, Page 49
69.[Warning 1417: Power Down Failure] displayed on DCS screen .....	WP 0008, Page 49
DCS malfunction.....	WP 0008, Page 49
70.[Warning 1441: Low Fuel Level] displayed on DCS screen.....	WP 0008, Page 49
Low fuel level or sensor malfunction .....	WP 0008, Page 49
71.[Warning 1442: Weak Battery] displayed on DCS screen .....	WP 0008, Page 49
a. Battery connections are loose or batteries are insufficiently charged .....	WP 0008, Page 50
b. Loose belt, defective battery-charging alternator or tensioner, or defective electrical component .....	WP 0008, Page 50
72.[Warning 1444: KW Overload] displayed on DCS screen .....	WP 0008, Page 50
Load cable or wiring malfunction .....	WP 0008, Page 50



<b><u>Malfunction/Symptom</u></b>	<b><u>Troubleshooting Procedure WP and Page</u></b>
73.[Warning 1449: Overfrequency] displayed on DCS screen .....	WP 0008, Page 51
Generator AC output frequency is high .....	WP 0008, Page 51
74.[Warning 1451: Genset/Bus Voltage Mismatch] displayed on DCS screen .....	WP 0008, Page 51
DCS fault .....	WP 0008, Page 51
75.[Warning 1469: Speed/Hz Mismatch] displayed on DCS screen.....	WP 0008, Page 53
Speed sensor error .....	WP 0008, Page 53
76.[Warning 1471: High Current Warning] displayed on DCS screen .....	WP 0008, Page 53
Short, overload, or AC generator malfunction .....	WP 0008, Page 53
77.[Warning 1689: Reset Real Time Clock] displayed on DCS screen .....	WP 0008, Page 53
Clock no longer accurate due to temporary power loss or backup battery failure .....	WP 0008, Page 53
78.[Warning 1845: Water In Fuel Sensor OOR High] displayed on DCS screen .....	WP 0008, Page 53
Water in fuel sensor shorted high.....	WP 0008, Page 53
79.[Warning 1846: Water In Fuel Sensor OOR Low] displayed on DCS screen.....	WP 0008, Page 54
Water in fuel sensor shorted low .....	WP 0008, Page 54
80.[Warning 2311: Fuel Injection Control Valve Failure] displayed on DCS screen.....	WP 0008, Page 54
Electrical or communication error .....	WP 0008, Page 54
81.[Warning 2336: Checksum Fault] displayed on DCS screen .....	WP 0008, Page 55
Calibration error .....	WP 0008, Page 55
82.[Warning 2545: Keyswitch Reset Required] displayed on DCS screen .....	WP 0008, Page 56
Electrical or communication error .....	WP 0008, Page 56
83.[Warning 2727: J1939 Datalink Error] displayed on DCS screen.....	WP 0008, Page 56
Electrical or communication error .....	WP 0008, Page 56
84.[Warning 2915: Genset Bus AC Meter Failed] displayed on DCS screen .....	WP 0008, Page 57
Generator set Bus AC meter failed.....	WP 0008, Page 57
85.[Warning 2917: Genset Bus Voltage High] displayed on DCS screen .....	WP 0008, Page 57
Paralleling or voltage sense fault.....	WP 0008, Page 57
86. [Warning 2936: Fuel Level Sensor High] displayed on DCS screen .....	WP 0008, Page 57
Fuel level sensor malfunction .....	WP 0008, Page 58
87.[Warning 2937: Fuel Level Sensor Low] displayed on DCS screen .....	WP 0008, Page 59
Fuel level sensor malfunction .....	WP 0008, Page 59
88.[Warning 2968: AVR Fault] displayed on DCS screen .....	WP 0008, Page 59
Wiring or AC generator failure .....	WP 0008, Page 59
89.[Warning 3662: Battery Discharge] displayed on DCS screen .....	WP 0008, Page 59
Loose belt, defective battery-charging alternator or tensioner, or defective electrical component.....	WP 0008, Page 59
90.[Warning 3666: Master Control Switch Configuration] displayed on DCS screen.....	WP 0008, Page 60

<u>Malfunction/Symptom</u>	<u>Troubleshooting Procedure WP and Page</u>
Engine control switch fault.....	WP 0008, Page 60
91.[Warning 3672: Automatic Field Flash Not Complete] displayed on DCS screen.....	WP 0008, Page 61
Wiring or DCS malfunction .....	WP 0008, Page 61
92.[Warning 3674: Genset Configuration Change] displayed on DCS screen .....	WP 0008, Page 61
Incorrect dip switch settings, wiring malfunction, or improper engine or AC generator combination.....	WP 0008, Page 62

## **ELECTRICAL SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE**

93.DCS indicates no power available and no lighted display .....	WP 0009, Page 2
a. Battery malfunction .....	WP 0009, Page 2
b. Circuit breaker or wiring malfunction.....	WP 0009, Page 3
c. Defective DCS.....	WP 0009, Page 5
94.EMERGENCY STOP push button fails to stop generator set.....	WP 0009, Page 5
EMERGENCY STOP push button failure .....	WP 0009, Page 5
95.No power to convenience receptacle or convenience receptacle fails to work .....	WP 0009, Page 6
Convenience receptacle is defective or has been subjected to a ground fault condition.....	WP 0009, Page 6
96.Circuit interrupter will not close or open .....	WP 0009, Page 8
Contactor or wiring malfunction .....	WP 0009, Page 8
97.Hour meter is no longer recording operating hours .....	WP 0009, Page 8
Defective hour meter .....	WP 0009, Page 8

## **ENGINE SYSTEM TROUBLESHOOTING WITH A DCS CODE**

98.[Fault 155: High Intake Manifold Temperature] displayed on DCS screen.....	WP 0010, Page 2
Charge air cooler or turbocharger problem. ....	WP 0010, Page 2
99.[Fault 234: Overspeed Shutdown] displayed on DCS screen.....	WP 0010, Page 3
Large block load removal or vapor drawn into intake air passage .....	WP 0010, Page 3
100.[Fault 359: Fail to Start] displayed on DCS screen.....	WP 0010, Page 4
a. Fuel tank is empty or improper connection.....	WP 0010, Page 4
b. Dirty air cleaner element, intake air hose restriction, or excess backpressure.....	WP 0010, Page 4
c. Fuel system malfunction. ....	WP 0010, Page 5
d. Improper clearance (open or close timing) of intake/exhaust valves.....	WP 0010, Page 5
e. Cold weather conditions.....	WP 0010, Page 5
f. Fuel injection malfunction.....	WP 0010, Page 6
g. Internal engine problem .....	WP 0010, Page 6
101.[Fault 415: Low Oil Pressure] displayed on DCS screen.....	WP 0010, Page 6
a. Low engine oil level.....	WP 0010, Page 6
b. Defective engine oil pressure sender.....	WP 0010, Page 7

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c. Internal engine problem .....	WP 0010, Page 7
d. Clogged oil strainer .....	WP 0010, Page 8
102.[Fault 449: High Fuel Supply Pressure] displayed on DCS screen. ....	WP 0010, Page 8
Fuel or fuel pump pressure malfunction .....	WP 0010, Page 8
103.[Fault 1245: Engine Shutdown] displayed on DCS screen. ....	WP 0010, Page 9
Unidentified engine ECM shutdown .....	WP 0010, Page 9
104.[Fault 1438: Fail to Crank] displayed on DCS screen.....	WP 0010, Page 9
a. DEAD CRANK SWITCH is not in NORMAL position or will not turn over engine .....	WP 0010, Page 9
b. Battery connections are loose or batteries are insufficiently charged .....	WP 0010, Page 9
c. Defective starter or flywheel.....	WP 0010, Page 10
d. Defective wiring or DCS .....	WP 0010, Page 10
105.[Warning 124: High Intake Manifold Pressure] displayed on DCS screen. ....	WP 0010, Page 11
Charge air cooler or turbocharger problem .....	WP 0010, Page 11
106.[Warning 143: Pre-Low Oil Pressure] displayed on DCS screen.....	WP 0010, Page 11
Engine oil malfunction .....	WP 0010, Page 12
107.[Warning 281: Cylinder Pressure Imbalance] displayed on DCS screen .....	WP 0010, Page 12
High-pressure fuel malfunction.....	WP 0010, Page 12
108.[Warning 418: High Water In Fuel] displayed on DCS screen.....	WP 0010, Page 12
Water in fuel.....	WP 0010, Page 12
109.[Warning 488: High Intake Manifold 1 Temp] displayed on DCS screen.....	WP 0010, Page 13
Charge air cooler or turbocharger problem .....	WP 0010, Page 14
110.[Warning 559: Low Injector Metering 1 Pressure] displayed on DCS screen.....	WP 0010, Page 14
Fuel pressure or fuel system malfunction.....	WP 0010, Page 14
111.[Warning 731: Crankshaft Mechanical Misalignment] displayed on DCS screen.....	WP 0010, Page 16
Crankshaft and camshaft engine speed sensor misaligned.....	WP 0010, Page 16
112.[Warning 1246: Unknown Engine Fault] displayed on DCS screen. ....	WP 0010, Page 17
Unidentified engine ECM shutdown .....	WP 0010, Page 17
113.[Warning 1852: Pre-High Water In Fuel] displayed on DCS screen.....	WP 0010, Page 17
Water in fuel.....	WP 0010, Page 17
114.[Warning 1992: High Speed Warning] displayed on DCS screen .....	WP 0010, Page 17
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**Malfunction/Symptom****Troubleshooting Procedure WP and Page****ENGINE SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE**

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a. Engine is leaking oil .....	WP 0011, Page 3
b. Engine is leaking coolant .....	WP 0011, Page 4
c. Engine is leaking fuel .....	WP 0011, Page 5
116.Engine cranks slowly and fails to start .....	WP 0011, Page 5
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b. Dirty air cleaner element or intake air restriction.....	WP 0011, Page 6
c. Fuel system malfunction .....	WP 0011, Page 6
d. Cold weather conditions.....	WP 0011, Page 7
e. Starter is defective/wiring is incorrect .....	WP 0011, Page 7
f. Flywheel is defective .....	WP 0011, Page 8
g. Fuel injection malfunction.....	WP 0011, Page 8
h. Internal engine problem .....	WP 0011, Page 8
117.Engine will not shut down.....	WP 0011, Page 9
Engine control switch fault.....	WP 0011, Page 9
118.Engine cranks normally but fails to start... ..	WP 0011, Page 9
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119.Engine starts but stops after starting... ..	WP 0011, Page 9
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c. Dirty air cleaner element or intake air restriction.....	WP 0011, Page 10
d. Engine control switch fault .....	WP 0011, Page 10
e. Fuel injection or DCS malfunction.....	WP 0011, Page 11
120.Engine stops suddenly during normal operation.....	WP 0011, Page 11
Engine malfunction .....	WP 0011, Page 11
121.Engine runs erratically, performs poorly (does not develop full power), or misfires....	WP 0011, Page 11
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b. Insufficient oil level .....	WP 0011, Page 12
c. Fuel system malfunction .....	WP 0011, Page 12
d. Turbocharger waste gate valve malfunction .....	WP 0011, Page 12
e. Valves improperly adjusted .....	WP 0011, Page 13
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122.Engine stability or hunting problems .....	WP 0011, Page 13
High or low ambient temperatures.....	WP 0011, Page 13
123.Excessive oil consumption .....	WP 0011, Page 13
a. Oil change overdue, incorrect grade or type (for ambient temperature range), or oil level too high .....	WP 0011, Page 13
b. Leakage from oil lines, oil filter, or valve cover .....	WP 0011, Page 14
c. Diluted engine oil.....	WP 0011, Page 14
d. Leaking rear oil seal .....	WP 0011, Page 14
e. Crankcase breather line clogged .....	WP 0011, Page 15
f. Improper seal of oil pan or clogged oil strainer .....	WP 0011, Page 15
g. Fuel injection malfunction.....	WP 0011, Page 15
h. Internal engine problem .....	WP 0011, Page 16
124.Engine knocks or makes excessive noise .....	WP 0011, Page 16
a. Oil level low .....	WP 0011, Page 16
b. Internal engine problem .....	WP 0011, Page 16
125.Abnormal or high-pitched ascending and descending sounds heard from engine compartment.....	WP 0011, Page 16
a. Turbocharger damage.....	WP 0011, Page 16
b. Exhaust system malfunction .....	WP 0011, Page 17
c. Engine problem .....	WP 0011, Page 17
126.White smoke seen emitting from engine compartment.....	WP 0011, Page 17
a. Coolant leak .....	WP 0011, Page 17
b. Fuel injection malfunction.....	WP 0011, Page 18
c. Turbocharger lube oil line or outlet oil line leak .....	WP 0011, Page 18
d. Internal engine problem .....	WP 0011, Page 18
127.Blue or black smoke from engine compartment with strong odors. ....	WP 0011, Page 18
Wires burning.....	WP 0011, Page 18
128.Oil mixed with coolant .....	WP 0011, Page 19
Leaking cylinder head assembly gasket or internal engine problem.....	WP 0011, Page 19
129.Oil mixed with fuel .....	WP 0011, Page 19
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130.Cold weather starting aids fail to work properly .....	WP 0011, Page 19
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**Malfunction/Symptom****Troubleshooting Procedure WP and Page****EXHAUST SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE**

131.High pitched hiss or whistle heard at exhaust outlet with a decrease in engine performance .....	WP 0012, Page 2
High back pressure or restriction in exhaust system .....	WP 0012, Page 2
132.Abnormal sounds heard from exhaust system with a decrease in engine performance .....	WP 0012, Page 3
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Loose or missing hardware of exhaust component .....	WP 0012, Page 5
135.Engine emits blue or black smoke with insufficient engine output.....	WP 0012, Page 6
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b. Dirty air cleaner element .....	WP 0012, Page 6
c. Obstruction in air intake system .....	WP 0012, Page 7
d. High back pressure or restriction in exhaust system .....	WP 0012, Page 7
e. Improper or contaminated fuel .....	WP 0012, Page 8
f. Improper open or close timing of intake/exhaust valves .....	WP 0012, Page 8
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h. Engine used at high temperatures or at high altitude .....	WP 0012, Page 8
i. Turbocharger assembly waste gate malfunction .....	WP 0012, Page 8
j. Fuel injection malfunction.....	WP 0012, Page 9
k. Internal engine malfunction .....	WP 0012, Page 9
136.Engine emits white exhaust smoke.....	WP 0012, Page 9
a. Fuel contaminated or improper fuel used .....	WP 0012, Page 9
b. Clogged exhaust pipe or muffler .....	WP 0012, Page 10
c. Clogged air filter .....	WP 0012, Page 10
d. Improper intake and exhaust valve open/closure .....	WP 0012, Page 11
e. Turbocharger lube oil line or outlet oil line leak.....	WP 0012, Page 11
f. Engine used at high temperatures or at high altitude .....	WP 0012, Page 11
g. Fuel injection malfunction.....	WP 0012, Page 11
h. Internal engine problem .....	WP 0012, Page 11

**Malfunction/Symptom****Troubleshooting Procedure WP and Page****WINTERIZATION KIT TROUBLESHOOTING**

137.[Warning 3663: Winterization Kit Failure to Heat] displayed on DCS screen .....	WP 0013, Page 2
a. Fuel tank is empty .....	WP 0013, Page 2
b. Clogged intake port .....	WP 0013, Page 2
c. Clogged exhaust pipe .....	WP 0013, Page 2
d. Clogged winterization kit fuel pump or malfunctioning fuel pump .....	WP 0013, Page 3
e. Winterization kit wiring or DCS failure.....	WP 0013, Page 3
138.[Warning 3671: Winterization Kit Low Voltage Warning] displayed on DCS screen .....	WP 0013, Page 5
a. Battery connections are loose or batteries are insufficiently charged .....	WP 0013, Page 5
b. Winterization kit wiring or DCS failure.....	WP 0013, Page 6
139.Winterization kit fails to turn off .....	WP 0013, Page 6
Defective flame or heat sensor.....	WP 0013, Page 6
140.Winterization kit activates under usual operating conditions .....	WP 0013, Page 6
Defective temperature sensor or DCS temperature sensor .....	WP 0013, Page 6

**END OF WORK PACKAGE**





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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**OPERATIONAL CHECKOUT**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Personnel Required**

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**References**

WP 0006, Warning and Fault Codes

WP 0008, Electrical System Troubleshooting with DCS Code

WP 0009, Electrical System Troubleshooting without DCS Code

WP 0010, Engine System Troubleshooting with DCS Code

**References**

WP 0011, Engine System Troubleshooting without DCS Code

WP 0016, Field Maintenance PMCS

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

WP 0037, Remove/Install Batteries

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10)

Engine cool

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**OPERATIONAL CHECKOUT****WARNING**

- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator set is running. Failure to comply may cause injury or death to personnel.

## WARNING

- High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that soldiers working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.
- NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.
- Shut down generator sets before performing inspection of load cables. Failure to comply may cause injury or death to personnel by electrocution.
- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.
- DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

## CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply may cause damage to equipment.

## NOTE

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field Maintenance PMCS).

### Inspect Ground Connection

#### STEP

1. Ensure equipment conditions are met in order presented in initial setup.
2. Ensure ground rod is in ground.
3. Ensure ground cable is connected to output panel.
4. Ensure ground cable is connected to ground rod.
5. Open ground rod door on front panel.
6. Verify that all three ground rods have been used.

**INDICATION/CONDITION**

Ground rods remain in rack or ground rod is not properly installed.

**CORRECTIVE ACTION**

Install ground properly or install remaining ground rods as required (TM 9-6115-752-10).

**STEP****WARNING**

High voltage is produced when this generator set is in operation. Do not contact output cables when operating this generator set. Failure to comply may cause injury or death to personnel.

Inspect connection of ground wire to ground rods for tightness and metal-to-metal contact.

**INDICATION/CONDITION**

Connection is loose. Metal-to-metal contact is interrupted.

**CORRECTIVE ACTION**

Tighten connections and reset metal-to-metal contact as required (TM 9-6115-752-10).

**STEP****WARNING**

Shut down generator sets before performing inspection of load cables. Failure to comply may cause injury or death to personnel by electrocution.

1. Open output box assembly door.
2. Inspect connection of ground wire to ground post on output terminal board for tightness and metal-to-metal contact.

**INDICATION/CONDITION**

Connection is loose. Metal-to-metal contact is interrupted.

**CORRECTIVE ACTION**

Tighten connections and reset metal-to-metal contact as required (TM 9-6115-752-10).

**Check Digital Control Screen (DCS) Function****STEP**

Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).

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**NOTE**

Under normal operating conditions, the control panel display will take 4 sec or more to establish contact with the Display and Main Controller Boards. While contact is being established, the screen display is gray. It will be indicated in the mode and status lines as: [Genset Mode: Unknown] and [Establishing Communications]. The length of time the screen is either blank or gray depends on ambient temperature. See TM 9-6115-752-10 for cold weather operations.

**INDICATION/CONDITION**

Operator control screen is not operating.

**CORRECTIVE ACTION**

1. Ensure battery cables are connected (WP 0037, Remove/Install Batteries).
2. Ensure batteries are charged (WP 0037, Remove/Install Batteries).
3. Ensure wires in DCS are properly seated and in working condition (WP 0017, Remove/Install DCS).
4. Test DCS (WP 0018, Repair DCS) and replace DCS (WP 0017, Remove/Install DCS) if batteries are connected and charged and wires are attached and working properly, but DCS does not function.

**STEP**

1. Turn BATTLESHORT switch ON (TM 9-6115-752-10).
2. Watch DCS for [Warning 1131: Battle Short Active].

**INDICATION/CONDITION**

BATTLESHORT warning does not appear on DCS screen.

**CORRECTIVE ACTION**

Check wiring of DCS and BATTLESHORT switch and replace as required (WP 0017, Remove/Install DCS and WP 0018, Repair DCS).

**Check Engine Function****STEP**

Start generator set (TM 9-6115-752-10).

**INDICATION/CONDITION**

Engine fails to start or never reaches rated speed.

**CORRECTIVE ACTION****CAUTION**

Do not crank engine in excess of 15 sec. Allow starter to cool for at least 15 sec between attempted starts. Failure to comply may cause damage to equipment.

Troubleshoot engine (WP 0010, Troubleshooting Procedures and WP 0011, Engine System Troubleshooting without a DCS Code).

**Check AC Generator Functions****CAUTION**

All of the following steps must be performed before releasing the AMMPS generator set for use. Failure to comply may cause damage to equipment.

**STEP****NOTE**

MEP 1061 operates at 400 Hz only. MEP 1061 needs to be checked for voltage settings only. MEP 1060 operates at 50 Hz or 60 Hz and must be checked for voltage and frequency. Repeat steps 1 through 4 with MEP 1060 set at each frequency. Set frequency on DCS using adjustments screen (TM 9-6115-752-10).

1. Set engine control switch to OFF (TM 9-6115-752-10).
2. Set AC generator voltage selection board to: 120/208-V, three-phase operation (TM 9-6115-752-10).
3. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
4. Push FAULT RESET (TM 9-6115-752-10) to clear [Warning 3667: Voltage Configuration Change] (WP 0006, Warning and Fault Codes).
5. Start generator set (TM 9-6115-752-10).

**INDICATION/CONDITION**

Output is not as requested from operator's control screen (TM 9-6115-752-10).

**CORRECTIVE ACTION**

Troubleshoot electrical system (WP 0008, Electrical System Troubleshooting with DCS Code and WP 0009, Electrical System Troubleshooting without DCS Code).

**STEP****NOTE**

MEP 1061 operates at 400 Hz only. MEP 1061 needs to be checked for voltage settings only. MEP 1060 operates at 50 Hz or 60 Hz and must be checked for voltage and frequency. Repeat steps 1 through 4 with MEP 1060 set at each frequency. Set frequency on DCS using adjustments screen (TM 9-6115-752-10).

1. Set engine control switch to OFF (TM 9-6115-752-10).
2. Set AC generator voltage selection board to: 240/416-V, three-phase operation (TM 9-6115-752-10).

3. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
4. Push FAULT RESET (TM 9-6115-752-10) to clear [Warning 3667: Voltage Configuration Change] (WP 0006, Warning and Fault Codes).
5. Start generator set (TM 9-6115-752-10).

**INDICATION/CONDITION**

Output is not as requested from operator's control screen (TM 9-6115-752-10).

**CORRECTIVE ACTION**

Troubleshoot electrical system (WP 0008, Electrical System Troubleshooting with DCS Code and WP 0009, Electrical System Troubleshooting without DCS Code).

**STEP**

1. Start generator set (TM 9-6115-752-10).
2. Allow generator set to warm up for 5 min.
3. Press AC CIRCUIT INTERRUPT button (TM 9-6115-752-10).
4. Look for CONTACTOR CLOSED indication on screen (TM 9-6115-752-10).

**INDICATION/CONDITION**

Contactor does not close.

**CORRECTIVE ACTION**

Troubleshoot electrical system (WP 0008, Electrical System Troubleshooting with DCS Code and WP 0009, Electrical System Troubleshooting without DCS Code).

**STEP****WARNING**

High voltage is produced when this generator set is in operation. Do not contact output cables when operating this generator set. Failure to comply may cause injury or death to personnel.

Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).

**INDICATION/CONDITION**

Generator set will not hold rated load for 30 min.

**CORRECTIVE ACTION**

Troubleshoot electrical or engine system (WP 0008, Electrical System Troubleshooting with a DCS Code; WP 0009, Electrical System Troubleshooting without a DCS Code; WP 0010, Engine System Troubleshooting with a DCS Code; and WP 0011, Engine System Troubleshooting without a DCS Code).

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**WARNING AND FAULT CODES**

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**INITIAL SETUP:****Personnel Required**

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**References**

TM 9-6115-752-10

TM 9-6115-758-13&amp;P

WP 0007, Cooling System Troubleshooting with a  
DCS Code**References**WP 0008, Electrical System Troubleshooting with a  
DCS CodeWP 0010, Engine System Troubleshooting with a  
DCS Code

WP 0013, Winterization Kit Troubleshooting

WP 0044, Service Fuel System

WP 0062, Remove/Install Current Transformers

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**DIGITAL CONTROL SYSTEM (DCS) WARNING AND FAULT CODES**

The AMMPS DCS displays real-time fault and warning codes on the top two lines of the operator main screen. Faults will result in equipment shut down. Warnings indicate items that may result in faults if unattended. The descriptions displayed on-screen and listed below provide detail about the occurrence of the fault code or warning code. By accessing the [Maintenance] screen (TM 9-6115-752-10), troubleshooting suggestions can be accessed and possible solutions indicated. The DCS must be reset using FAULT RESET switch as faults and warnings are addressed. Use the codes displayed by the DCS and the "ACTION" column in Table 1 and Table 2 to resolve problems with the AMMPS system.

**Table 1. Fault Codes.**

<b>CODE AND PANEL TEXT</b>	<b>MAINTENANCE SCREEN DESCRIPTION</b>	<b>ACTION</b>
[Fault 111: ECM Failure]	[Engine Control Module Critical Internal Failure — Bad Intelligent Device or Component]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Fault 115: Speed Signal Lost]	[Engine Magnetic Crankshaft Speed/Position lost both of two signals — Data Erratic Intermittent or Incorrect.]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Fault 151: High Coolant Temp]	[Engine Coolant Temperature — Data Valid but Above Normal Operational Range — Most Severe Level]	WP 0007, Cooling System Troubleshooting with a DCS Code
[Fault 155: High Intake Manifold 1 Temp – Most Severe]	[Intake Manifold 1 Temperature — Data Valid but Above Normal Operational Range — Most Severe Level]	WP 0010, Engine System Troubleshooting with a DCS Code
[Fault 234: Overspeed Shutdown]	[Engine Crankshaft Speed/Position — Data Valid but Above Normal Operational Range — Most Severe Level]	WP 0010, Engine System Troubleshooting with a DCS Code
[Fault 342: Calibration Code Failure]	[Electronic Calibration Code Incompatibility — Out of Calibration]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Fault 359: Fail to Start]	[Engine Failed Automatic Start – Condition Exists]	WP 0010, Engine System Troubleshooting with a DCS Code
[Fault 415: Low Oil Pressure]	[Engine Oil Rifle Pressure — Data Valid but Below Normal Operational Range — Most Severe Level]	WP 0010, Engine System Troubleshooting with a DCS Code
[Fault 449: High Fuel Supply Pressure]	[Injector Metering Rail 1 Pressure — Data Valid but Above Normal Operational Range — Most Severe Level]	WP 0010, Engine System Troubleshooting with a DCS Code
[Fault 781: CAN Data Link Failure]	[SAE J1939 Data Link 2 Engine Network – Abnormal Update Rate]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Fault 1245: Engine Shutdown]	[An Engine Shutdown Fault has Occurred]	WP 0010, Engine System Troubleshooting with a DCS Code
[Fault 1257: Control Module ID Input State Failure]	[Control Module Identification Input State Error - Data Erratic, Intermittent, or Incorrect]	WP 0008, Electrical System Troubleshooting with a DCS Code



Table 1. Fault Codes — Continued.

CODE AND PANEL TEXT	MAINTENANCE SCREEN DESCRIPTION	ACTION
[Fault 1433: Local E-Stop]	[Local E-Stop Button Engaged]	The local EMERGENCY STOP button has been pressed. Pull the button out. Acknowledge the faults and reset them to return to normal operating mode. If symptom continues, see WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 1434: Remote E-Stop]	[Remote E-Stop Signal Active]	Turn off the remote emergency stop. Acknowledge the faults and reset them to return to normal operating mode. If symptom continues, see WP 0008, Electrical System Troubleshooting with a DCS Code.
[Fault 1438: Fail To Crank]	[Engine Failed To Crank]	WP 0010, Engine System Troubleshooting with a DCS Code
[Fault 1445: Short Circuit]	[Alternator Current is Greater Than 175% of Maximum Line Current]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Fault 1446: High AC Voltage]	[AC Output Voltage is Greater Than High AC Voltage Threshold (130%)]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Fault 1447: Low AC Voltage]	[AC Output Voltage is Less Than Low AC Voltage Threshold (70%)]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Fault 1448: Underfrequency]	[Generator AC Output Frequency — Data Valid But Below Normal Operating Range — Moderately Severe Level]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Fault 1452: Genset Contactor Fail To Close]	[Genset Contactor Failed to Close Within the Specified Close Time Delay]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Fault 1453: Genset Contactor Fail To Open]	[Genset Contactor Failed to Open Within the Specified Open Time Delay]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Fault 1459: Reverse Power]	[Generator is Absorbing Power from the Bus]	Ensure orientation of current transformers is correct (WP 0062, Remove/Install Current Transformers). See TM 9-6115-758-13&P if symptom continues.
[Fault 1461: Loss of Field]	[Generator is Absorbing Reactive Power from the Bus]	TM 9-6115-758-13&P
[Fault 1472: High Current Shutdown]	[Alternator Current is Between 110% – 175% of Maximum Line Current for More Than the Shutdown Set Time]	WP 0008, Electrical System Troubleshooting with a DCS Code

Table 1. Fault Codes — Continued.

CODE AND PANEL TEXT	MAINTENANCE SCREEN DESCRIPTION	ACTION
[Fault 1918: Fuel Level Low]	[Very Low Fuel Level Detected by the Analog Sensor]	Fill generator set with proper fuel. See WP 0044, Service Fuel System. See WP 0008, Electrical System Troubleshooting with a DCS Code if symptom continues.
[Fault 2335: Excitation Fault]	[Loss of AC Phase Voltage Sensing — Condition Exists]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Fault 2336: Checksum Fault]	[The Controller Checksum Calculation Differs From the Calibration Download]	Follow steps in Recovering AMMPS DCS if Initial Calibration Fails task (WP 0100, General Maintenance)
[Fault 2914: Genset AC Meter failed]	[Genset AC Meter Chip Failed Health Check]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Fault 2972: Field Overload]	[AVR Field at Maximum Field Drive Limit for Greater than the Maximum Field Time]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Fault 3659: Switch Box Fail To Open]	[The Switch Box Contactor Failed to Open Within Specified Open Time Delay]	TM 9-6115-758-13&P
[Fault 3664: Invalid Genset Configuration]	[Engine Model Identification Bits are Set to an Invalid Setting]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Fault 3665: Invalid Voltage Configuration]	[Output Voltage Configuration is Invalid for the Given Genset Configuration]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Fault 3668: Output Voltage Config Bit 0 Changed]	[The State of the Output Voltage Configuration Bit 0 has Changed]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Fault 3669: Output Voltage Config Bit 1 Changed]	[The State of the Output Voltage Configuration Bit 1 has Changed]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Fault 3673: Convenience Receptacle AC Meter Failed]	[Convenience Receptacle AC Meter Chip Failed Health Check]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Fault 3677: Genset Configuration Factory Test Fault]	[Genset Configuration ID Bits Do Not Match the Expected Genset Configuration]	WP 0008, Electrical System Troubleshooting with a DCS Code

Table 2. Warning Codes.

CODE AND PANEL TEXT	MAINTENANCE SCREEN DESCRIPTION	ACTION
[Warning 121: Speed Signal Error]	[Engine Magnetic Crankshaft Speed/Position Lost One of Two Signals — Abnormal Rate of Change]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 122: Intake Manifold Pressure Sensor High]	[Intake Manifold 1 Pressure Sensor Circuit — Voltage Above Normal or Shorted to High Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 123: Intake Manifold Pressure Sensor Low]	[Intake Manifold 1 Pressure Sensor Circuit — Voltage Below Normal, or Shorted to Low Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 124: High Intake Manifold Pressure]	[Intake Manifold 1 Pressure - Data Valid but Above Normal Operational Range — Moderately Severe Level]	WP 0010, Engine System Troubleshooting with a DCS Code
[Warning 135: Oil Pressure Sensor High]	[Engine Oil Rifle Pressure 1 Sensor Circuit - Voltage Above Normal, or Shorted to High Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 141: Oil Pressure Sensor Low]	[Engine Oil Rifle Pressure 1 Sensor Circuit - Voltage Below Normal, or Shorted to Low Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 143: Pre-Low Oil Pressure]	[Engine Oil Rifle Pressure — Data Valid but Below Normal Operational Range — Moderately Severe Level]	WP 0010, Engine System Troubleshooting with a DCS Code
[Warning 144: Coolant Temperature Sensor OOR High]	[Engine Coolant Temperature 1 Sensor Circuit — Voltage Above Normal, or Shorted to High Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 145: Coolant Temperature Sensor OOR Low]	[Engine Coolant Temperature 1 Sensor Circuit — Voltage Below Normal, or Shorted to Low Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 146: Pre-High Coolant Temperature]	[Engine Coolant Temperature — Data Valid but Above Normal Operational Range — Moderately Severe Level]	WP 0007, Cooling System Troubleshooting with a DCS Code
[Warning 153: Intake Manifold Temperature Sensor High]	[Intake Manifold 1 Temperature Sensor Circuit — Voltage Above Normal, or Shorted to High Source]	WP 0008, Electrical System Troubleshooting with a DCS Code

Table 2. Warning Codes — Continued.

CODE AND PANEL TEXT	MAINTENANCE SCREEN DESCRIPTION	ACTION
[Warning 154: Intake Manifold Temperature Sensor Low]	[Intake Manifold 1 Temperature Sensor Circuit — Voltage Below Normal, or Shorted to Low Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 221: Ambient Air Pressure Sensor High]	[Barometric Pressure Sensor Circuit — Voltage Above Normal, or Shorted to High Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 222: Air Pressure Sensor Low]	[Barometric Pressure Sensor Circuit — Voltage Below Normal, or Shorted to Low Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 238: Sensor Supply 3 Low]	[Sensor Supply 3 Circuit — Voltage Below Normal, or Shorted to Low Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 239: Sensor Supply 3 High]	[Sensor Supply Voltage 3 Circuit — Voltage Above Normal, or Shorted to High Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 271: Fuel Pressure Solenoid Valve Low]	[Fuel Pump Pressurizing Assembly 1 Circuit — Voltage Below Normal, or Shorted to Low Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 272: Fuel Pressure Solenoid Valve High]	[Fuel Pump Pressurizing Assembly 1 Circuit — Voltage Above Normal, or Shorted to High Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 281: Cylinder Pressure Imbalance]	[Engine Fuel Pump Pressurizing Assembly 1 — Mechanical System not Responding or Out of Adjustment]	WP 0010, Engine System Troubleshooting with a DCS Code
[Warning 285: CAN Multiplex PGN Rate Error]	[SAE J1939 Multiplexing PGN Timeout Error — Abnormal Update Rate]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 286: CAN Multiplex Calibration Error]	[SAE J1939 Multiplexing Configuration Error - Out of Calibration]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 295: Ambient Air Pressure Sensor Error]	[Barometric Pressure — Data Erratic, Intermittent or Incorrect]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 319: Real Time Clock Error]	[Real Time Clock Power Interrupt – Data Erratic, Intermittent, or Incorrect]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 322: Injector Solenoid 1 Low Current]	[Injector Solenoid Driver Cylinder 1 Circuit — Current Below Normal, or Open Circuit]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 324: Injector Solenoid 3 Low Current]	[Injector Solenoid Driver Cylinder 3 Circuit — Current Below Normal, or Open Circuit]	WP 0008, Electrical System Troubleshooting with a DCS Code

Table 2. Warning Codes — Continued.

CODE AND PANEL TEXT	MAINTENANCE SCREEN DESCRIPTION	ACTION
[Warning 331: Injector Solenoid 2 Low Current]	[Injector Solenoid Driver Cylinder 2 Circuit — Current Below Normal, or Open Circuit]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 332: Injector Solenoid 4 Low Current]	[Injector Solenoid Driver Cylinder 4 Circuit — Current Below Normal, or Open Circuit]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 343: ECM Hardware Failure]	[Engine Control Module Warning Internal Hardware Failure — Bad Intelligent Device or Component]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 351: Injector Power Supply Failure]	[Injector Power Supply — Bad Intelligent Device or Component]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 352: Sensor Supply 1 Low]	[Sensor Supply 1 Circuit — Voltage Below Normal, or Shorted to Low Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 386: Sensor Supply 1 High]	[Sensor Supply 1 Circuit — Voltage Above Normal, or Shorted to High Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 418: High Water In Fuel]	[Water in Fuel Indicator — Data Valid but Above Normal Operational Range — Least Severe Level]	WP 0010, Engine System Troubleshooting with a DCS Code
[Warning 427: CAN Data Link Degraded]	[Communication Between the ECM and Another Device on the SAE J1939 Data Link has Been Lost]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 435: Oil Pressure Switch Error]	[Oil Temperature Reading Inconsistent at Initialization]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 441: Low Battery Voltage]	[Battery 1 Voltage — Data Valid but Below Normal Operational Range — Moderately Severe Level]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 442: High Battery Voltage]	[Battery 1 Voltage — Data Valid but Above Normal Operational Range — Moderately Severe Level]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 451: Injector Metering Rail 1 Pressure: High Voltage]	[Injector Metering Rail 1 Pressure Sensor Circuit — Voltage Above Normal, or Shorted to High Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 452: Injector Metering Rail 1 Pressure: Low Voltage]	[Injector Metering Rail 1 Pressure Sensor Circuit — Voltage Below Normal, or Shorted to Low Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 488: High Intake Manifold 1 Temp]	[Intake Manifold 1 Temperature — Data Valid but Above Normal Operational Range — Moderately Severe Level]	WP 0010, Engine System Troubleshooting with a DCS Code

Table 2. Warning Codes — Continued.

CODE AND PANEL TEXT	MAINTENANCE SCREEN DESCRIPTION	ACTION
[Warning 496: Speed Sensor Supply Voltage Error]	[Engine Speed/Position Sensor 2 (Camshaft) Supply Voltage — Root Cause Not Known]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 554: APC Pressure Error]	[Injector Metering Rail 1 Pressure — Data Erratic, Intermittent or Incorrect]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 559: Low Injector Metering 1 Pressure]	[Injector Metering Rail 1 Pressure — Data Valid but Below Normal Operational Range — Moderately Severe Level]	WP 0010, Engine System Troubleshooting with a DCS Code
[Warning 689: Crankshaft Speed Error]	[Engine Crankshaft Speed/Position — Data Erratic, Intermittent, or Incorrect]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 697: ECM Temp High]	[ECM Internal Temperature Sensor Circuit — Voltage Above Normal, or Shorted to High Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 698: ECM Temp Low]	[ECM Internal Temperature Sensor Circuit — Voltage Below Normal, or Shorted to Low Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 731: Crankshaft Mechanical Misalignment]	[Engine Speed/Position Camshaft and Crankshaft Misalignment — Mechanical System not Responding or Out of Adjustment]	WP 0010, Engine System Troubleshooting with a DCS Code
[Warning 757: ECM Data Lost]	[ECM Data Has Been Lost]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 782: CAN Data Link Failure]	[SAE J1939 Data Link 2 Engine Network No Data Received — Condition Exists]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 1117: Power Lost With Ignition On]	[Power Lost With Ignition On — Data Erratic, Intermittent, or Incorrect]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 1131: Battle Short Active]	[Battle Short Mode Active]	Displays on DCS screen when BATTLESHORT switch is ON. See WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 1246: Unknown Engine Fault]	[An Unrecognized Engine Fault has been Received Over the Datalink]	WP 0010, Engine System Troubleshooting with a DCS Code
[Warning 1376: Camshaft Speed Error]	[Engine Camshaft Speed/Position Sensor — Data Erratic, Intermittent, or Incorrect]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 1416: Fail to Shutdown]	[The System Has Failed to Shutdown]	Displays on DCS screen when BATTLESHORT switch is ON and a fault occurs. Switch off BATTLESHORT to determine fault.

Table 2. Warning Codes — Continued.

CODE AND PANEL TEXT	MAINTENANCE SCREEN DESCRIPTION	ACTION
[Warning 1417: Power Down Failure]	[The System Has Failed to Power Down]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 1441: Low Fuel Level]	[Low Fuel Level Detected by the Analog Sensor]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 1442: Weak Battery]	[Battery Voltage Below Normal Operating Voltage During Genset Startup]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 1444: KW Overload]	[The KW Load on Genset is Over the Overload Warning Threshold Continuously for More Than the Overload Warning Set Time]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 1449: Overfrequency]	[Generator AC Output Frequency — Data Valid But Above Normal Operating Range — Moderately Severe Level]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 1451: Genset/Bus Voltage Mismatch]	[Genset Output Voltage and Bus Voltage are Out of Calibration]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 1456: Bus Out Of Synchronization Range]	[Bus Voltage and/or Frequency are Outside Set Limits for Synchronizing]	TM 9-6115-758-13&P
[Warning 1457: Fail To Synchronize]	[Genset Failed to Synchronize within Set Time]	TM 9-6115-758-13&P
[Warning 1458: Synch Phase Rotation Mismatch]	[Genset and Bus Phase Rotations are Reading Opposite for More Than the Dedicated Set Time]	TM 9-6115-758-13&P
[Warning 1469: Speed/Hz Mismatch]	[Genset Measured Speed and AC Output Frequency Conflict — Condition Exists]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 1471: High Current Warning]	[Alternator Current Reading Between 110% – 175% of Maximum Line Current for More than the Warning Set Time]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 1689: Reset Real Time Clock]	[Power to the RTC Chip has been Lost, Clock no Longer Accurate]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 1845: Water In Fuel Sensor OOR High]	[Water in Fuel Indicator Sensor Circuit — Voltage Above Normal, or Shorted to High Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 1846: Water In Fuel Sensor OOR Low]	[Water in Fuel Indicator Sensor Circuit — Voltage Below Normal, or Shorted to Low Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 1852: Pre-High Water In Fuel]	[Water in Fuel Indicator — Data Valid but Above Normal Operational Range — Moderately Severe Level]	WP 0010, Engine System Troubleshooting with a DCS Code

**Table 2. Warning Codes — Continued.**

<b>CODE AND PANEL TEXT</b>	<b>MAINTENANCE SCREEN DESCRIPTION</b>	<b>ACTION</b>
[Warning 1992: High Speed Warning]	[Engine Crankshaft Speed/Position — Data Valid but Above Normal Operational Range — Moderately Severe Level]	WP 0010, Engine System Troubleshooting with a DCS Code
[Warning 2311: Fuel Injection Control Valve Failure]	[Electronic Fuel Injection Control Valve Circuit — Condition Exists]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 2336: Checksum Fault]	[The Controller Checksum Calculation Differs From the Calibration Download]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 2545: Keyswitch Reset Required]	[Unable to Establish Communications with Engine]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 2727: J1939 Datalink Error]	[SAE J1939 Data Link to Engine Network Error]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 2915: Gen Bus AC Meter Failed]	[Genset Bus AC Meter Chip Failed Health Check]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 2917: Genset Bus Voltage High]	[Genset Bus Voltage — Voltage Above Normal, or Shorted to High Source]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 2936: Fuel Level Sensor High]	[Fuel Level OOR high fault from the I/O module]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 2937: Fuel Level Sensor Low]	[Fuel Level OOR low fault from the I/O module]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 2968: AVR Fault]	[The AVR fault output is active]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 3658: Switch Box Fail To Close]	[The Switch Box Contactor Failed to Close Within Specified Close Time Delay]	TM 9-6115-758-13&P
[Warning 3661: Maintenance Item is Active]	[The Time Interval for a Genset Maintenance Item or Deferred Maintenance Item has Expired and Requires a Maintenance Action]	Address maintenance item and perform as required. Reset code once maintenance item is addressed (TM 9-6115-752-10).
[Warning 3662: Battery Discharge]	[Battery Discharge Condition Detected]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 3663: Winterization Kit Failure to Heat]	[Winterization Kit Failed to Heat Engine Coolant]	WP 0013, Winterization Kit Troubleshooting
[Warning 3666: Master Control Switch Configuration]	[The Number of Active Master Control Switch Inputs is Not Equal to 1]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 3667: Voltage Configuration Change]	[The Output Voltage Configuration has Changed]	Displays on DCS screen when voltage selection board is used to change the generator set voltage configuration (TM 9-6115-752-10). Push FAULT/RESET switch to clear fault on DCS display.



**Table 2. Warning Codes — Continued.**

<b>CODE AND PANEL TEXT</b>	<b>MAINTENANCE SCREEN DESCRIPTION</b>	<b>ACTION</b>
[Warning 3671: Winterization Kit Low Voltage Warning]	[The Genset Battery Voltage is Too Low to Run Winterization Kit]	WP 0013, Winterization Kit Troubleshooting
[Warning 3672: Automatic Field Flash Not Complete]	[The Field Flash Cycle did not Complete Successfully]	WP 0008, Electrical System Troubleshooting with a DCS Code
[Warning 3674: Genset Configuration Change]	[The Genset Configuration has Changed]	Displays on DCS screen when the DCS recognizes the configuration has changed. This warning is most likely when a DCS is moved from one size generator set to a different size generator set. Push FAULT/RESET and continue normal use of the generator set. If symptom continues, see WP 0008, Electrical System Troubleshooting with a DCS Code.
[Warning 3678: Genset Frequency Changed]	[The Genset Frequency has Changed]	MEP 1060 only. Displays on DCS screen after changing generator set frequency from 60 Hz to 50 Hz or 50 Hz to 60 Hz (TM 9-6115-752-10). Push FAULT/RESET switch to clear fault on DCS display.

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**COOLING SYSTEM TROUBLESHOOTING WITH A DCS CODE**

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**INITIAL SETUP:****Test Equipment**

Test Set, Electronic Systems (WP 0179, Table 2, Item 25)

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Personnel Required**

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**References**

TM 9-6115-752-10

WP 0008, Electrical System Troubleshooting with a DCS Code

WP 0011, Engine System Troubleshooting without a DCS Code

WP 0012, Exhaust System Troubleshooting without a DCS Code

WP 0013, Winterization Kit Troubleshooting

WP 0016, Field PMCS

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

WP 0022, Service Cooling System

WP 0023, Remove/Install Coolant Recovery System

WP 0024, Remove/Install Cooling Fans

WP 0025, Remove/Install Radiator Hose and Tube Assemblies

WP 0026, Remove/Install Winterization Kit Components

**References**

WP 0028, Remove/Install Radiator Assembly

WP 0038, Remove/Install Relay Panel

WP 0039, Remove/Install Engine Wiring Harness

WP 0066, Remove/Install 50/60 Hz Engine Assembly

WP 0067, Remove/Install 400 Hz Engine Assembly

WP 0068, Service Lubrication System

WP 0071, Remove/Install Oil Cooler

WP 0074, Test/Replace Fuel Injectors

WP 0075, Remove/Install High-Pressure Fuel Pump

WP 0076, Remove/Install Water Pump

WP 0077, Remove/Install Thermostat

WP 0080, Remove/Install Battery-Charging Alternator Belt

WP 0087, Remove/Install Engine ECM Wiring Harness

WP 0100, General Maintenance

Foldout Pages

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**COOLING SYSTEM TROUBLESHOOTING WITH A DCS CODE****WARNING**

Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Failure to comply may cause injury or death to personnel.

**NOTE**

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Read the entire corrective action sequence before beginning steps to complete corrective action for a malfunction.

FAULT RESET switch must be pushed to clear each fault code as it is addressed.

Capture spilled fluids and dispose of IAW local Standard Operating Procedure (SOP).

**SYMPTOM**

[Fault 151: High Coolant Temperature] displayed on DCS screen.

**NOTE**

[Warning 146: Pre-High Coolant Temperature] is displayed on the DCS screen when coolant temperature reaches 230°F (110°C). [Fault 151: High Coolant Temperature] is displayed on the DCS screen and results in a generator set shutdown when coolant temperature reaches 237°F (113.89°C).

**MALFUNCTION**

Low coolant level, improper type used, or clogged cooling fins in radiator.

**CORRECTIVE ACTION**

- STEP 1. Check coolant level in coolant overflow bottle first, and then check coolant level in radiator (TM 9-6115-752-10). Add coolant as required (TM 9-6115-752-10).
- STEP 2. Check radiator for excessive debris or clogs on cooling fins. Remove or clean debris or clogs as required (WP 0022, Service Cooling System).
- STEP 3. If symptom continues, verify proper type of coolant is used (TM 9-6115-752-10).
- STEP 4. If improper coolant or mixture is suspected, drain cooling system and fill with proper coolant (WP 0022, Service Cooling System).
- STEP 5. If leak is suspected or symptom continues, proceed to next malfunction.

**MALFUNCTION**

Loose, defective, or improperly fitted radiator cap or coolant overflow bottle cap.

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**CORRECTIVE ACTION****WARNING**

- Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.
- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.

STEP 1. Check for loose, improperly fitted, or visibly defective radiator cap and coolant overflow bottle cap.

STEP 2. Install properly if loose or improperly fitted or replace if damaged (WP 0028, Remove/Install Radiator Assembly and WP 0023, Remove/Install Coolant Recovery System).

STEP 3. If properly secured, test radiator cap to determine proper operation (WP 0022, Service Cooling System).

STEP 4. If defective, replace as required (WP 0028, Remove/Install Radiator Assembly).

STEP 5. Check coolant level in radiator and coolant overflow bottle (TM 9-6115-752-10).

STEP 6. Add coolant if necessary (TM 9-6115-752-10).

STEP 7. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Coolant system leak.

**CORRECTIVE ACTION**

STEP 1. Perform a cooling system pressure check at radiator (WP 0022, Service Cooling System).

STEP 2. If loss of pressure is observed on gage of cooling system tester, proceed to STEP 4.

STEP 3. If no pressure loss is observed, proceed to next malfunction.

STEP 4. Check radiator and coolant overflow bottle hoses and clamps (WP 0023, Remove/Install Coolant Recovery System and WP 0025, Remove/Install Radiator Hose and Tube Assemblies), hoses and clamps at water pump (WP 0076, Remove/Install Water Pump), hoses and clamps at winterization kit (WP 0026, Remove/Install Winterization Kit Components), and hoses and clamps at oil cooler (WP 0071, Remove/Install Oil Cooler) for signs of leakage and replace any hose or clamp as necessary.

STEP 5. Check radiator for signs of leaks and replace as required (WP 0028, Remove/Install Radiator Assembly).

STEP 6. Check coolant overflow bottle for signs of leaks and replace as required (WP 0023, Remove/Install Coolant Recovery System).

STEP 7. Check water pump and hoses for leaks and replace water pump, hoses, or gasket as required (WP 0076, Remove/Install Water Pump).

STEP 8. Check freeze plugs on engine for leaks. Replace freeze plugs if leaks are found (WP 0100, General Maintenance).

STEP 9. Flush cooling system; fill as required (WP 0022, Service Cooling System).

STEP 10. If symptom continues, proceed to next malfunction.

### **MALFUNCTION**

Inoperable thermostat.

### **CORRECTIVE ACTION**

STEP 1. Test thermostat and replace if defective (WP 0077, Remove/Install Thermostat).

STEP 2. If symptom continues, proceed to next malfunction.

### **MALFUNCTION**

Inoperable cooling fan(s).

### **CORRECTIVE ACTION**

## **WARNING**

Cooling fan has sharp blades. Use caution and wear gloves when removing or installing fan. Failure to comply may cause injury or death to personnel.

## **NOTE**

Cooling fan(s) should run at high Pulse Width Modulated (PWM) signal when coolant temperature is above 223°F (106.1°C). Fan speed (controlled by PWM signal) directly corresponds to PWM signal which is dependent on coolant temperature.

STEP 1. Check air intake for obstruction and remove any obstruction.

STEP 2. Test cooling fan operation by disconnecting ECM engine temperature sensor wire (WP 0087, Remove/Install Engine ECM Wiring Harness) or by using InPower AMMPS software (WP 0100, General Maintenance).

STEP 3. Start generator set and allow it to reach rated speed (TM 9-6115-752-10).

STEP 4. Compare fan speed PWM visually or with InPower AMMPS software (WP 0100, General Maintenance) to coolant temperature. See Table 1.

**Table 1. Cooling Fan PWM Signal.**

<b>COOLANT TEMPERATURE (°F)</b>	<b>PERCENTAGE OF PWM</b>
-60°F (-51.1°C)	0
198°F (92.2°C)	0
199°F (92.7°C)	0
200°F (93.3°C)	20
223°F (106.1°C)	49
210°F (98.9°C)	61
223°F (106.1°C)	65
227°F (108.3°C)	65

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- STEP 5. If fan(s) is not operating, install ECM temperature sensor connector and check cooling fan circuit breakers and relays, resetting or replacing as required (WP 0038, Remove/Install Relay Panel).
- STEP 6. If cooling fans are found to be operating properly, connect ECM temperature sensor connector and proceed to next malfunction.
- STEP 7. If symptom continues, use wiring diagrams and a multimeter set to test continuity to check cooling fan(s) wiring to relay panel and DCS for opens or shorts (WP 0100, General Maintenance and Foldout Pages).
- STEP 8. Replace or repair wiring or connectors as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).
- STEP 9. If symptom continues, replace cooling fan(s) (WP 0024, Remove/Install Cooling Fans).
- STEP 10. If symptom continues, check DCS LEDs and replace as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

**MALFUNCTION**

Defective temperature sensor.

**CORRECTIVE ACTION**

- STEP 1. Troubleshoot IAW [Warning 144: Coolant Temp Sensor OOR High] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).
- STEP 2. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Generator set overload.

**CORRECTIVE ACTION**

- STEP 1. Check generator set overload by checking the generator line current indicator on the generator status display screen.
- STEP 2. Proceed to next malfunction if generator set is operating at proper load.
- STEP 3. If load is too great for the generator set, replace with a larger generator set to match load requirements.

**MALFUNCTION**

Excessive slack in battery-charging alternator belt.

**CORRECTIVE ACTION**

- STEP 1. Check battery-charging alternator belt for excessive wear and replace as required (WP 0080, Remove/Install Battery-Charging Alternator Belt).
- STEP 2. Ensure automatic belt tensioner is applying tension to battery-charging alternator belt (WP 0080, Remove/Install Battery-Charging Alternator Belt).
- STEP 3. Replace automatic belt tensioner if malfunction is detected (WP 0080, Remove/Install Battery-Charging Alternator Belt).
- STEP 4. Check water pump pulley for smooth turning and proper seating of belt.

STEP 5. Replace water pump pulley if malfunction is detected (WP 0076, Remove/Install Water Pump).

STEP 6. If not defective, proceed to next malfunction.

### **MALFUNCTION**

Improperly operating water pump.

#### **CORRECTIVE ACTION**

STEP 1. Turn shaft/pulley of water pump to feel for excessive resistance and play in the shaft.

STEP 2. Replace water pump if improper operation is suspected (WP 0076, Remove/Install Water Pump).

STEP 3. Observe engine temperature after replacement and check for engine overheating.

STEP 4. If water pump is operating properly, proceed to next malfunction.

### **MALFUNCTION**

Insufficient cooling effect of radiator.

#### **CORRECTIVE ACTION**

### **WARNING**

- Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.
- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.
  - STEP 1. Check hoses for obstructions, rust, or buildup and for signs of kinking causing restriction. Repair or replace as required (WP 0025, Remove/Install Radiator Hose and Tube Assemblies).
  - STEP 2. Observe engine temperature on DCS screen (TM 9-6115-752-10).
  - STEP 3. Replace radiator if insufficient cooling effect of radiator continues (WP 0028, Remove/Install Radiator Assembly).
  - STEP 4. If not defective, proceed to next malfunction.

### **MALFUNCTION**

Low engine oil level.

#### **CORRECTIVE ACTION**

STEP 1. Add oil to the proper level (TM 9-6115-752-10).

STEP 2. If engine oil is low, troubleshoot lubrication system for excessive oil consumption (WP 0011, Engine System Troubleshooting without a DCS Code).

STEP 3. If full, proceed to next malfunction.



**MALFUNCTION**

Clogged muffler or clog in exhaust system.

**CORRECTIVE ACTION**

STEP 1. Troubleshoot exhaust system for restriction (high back pressure/restriction in exhaust system) (WP 0012, Exhaust System Troubleshooting without a DCS Code).

STEP 2. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Engine used at high temperatures or at high altitude.

**CORRECTIVE ACTION**

STEP 1. Check output drop and load matching requirements. Reduce load as required (TM 9-6115-752-10).

STEP 2. If not applicable, proceed to next malfunction.

**MALFUNCTION**

Improper fuel injection.

**CORRECTIVE ACTION**

STEP 1. Test fuel injectors and replace fuel injectors as required (WP 0074, Test/Replace Fuel Injectors).

STEP 2. If not defective, proceed to next malfunction.

**MALFUNCTION**

Internal engine problem.

**CORRECTIVE ACTION**

Replace engine (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).

**SYMPTOM**

[Warning 146: Pre-High Coolant Temperature] displayed on DCS screen.

**MALFUNCTION**

Cooling system malfunction.

**CORRECTIVE ACTION**

Troubleshoot IAW [Fault 151: High Coolant Temperature] displayed on DCS screen symptom.

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**ELECTRICAL SYSTEM TROUBLESHOOTING WITH A DCS CODE**

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**INITIAL SETUP:****Test Equipment**

Cable, Remote Control (WP 0179, Table 2, Item 6)

Test Set, Electronic Systems (WP 0179, Table 2, Item 25)

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Cloth, cleaning, electronics (WP 0180, Expendable and Durable Items List, Item 13)

**Personnel Required**

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Assistant

**References**

TM 9-6115-752-10

TM 9-6115-758-13&P

WP 0002, Equipment Description and Data

WP 0009, Electrical Troubleshooting without a DCS Code

WP 0010, Engine System Troubleshooting with a DCS Code

WP 0011, Engine System Troubleshooting without a DCS Code

WP 0016, Field PMCS

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

WP 0022, Service Cooling System

WP 0037, Remove/Install Batteries

WP 0038, Remove/Install Relay Panel

WP 0039, Remove/Install Engine Wiring Harness

WP 0041, Remove/Install Main DC Circuit Breaker

WP 0044, Service Fuel System

**References**

WP 0051, Remove/Install Fuel Level Sensor

WP 0055, Remove/Install 50/60 Hz AC Generator Assembly

WP 0056, Remove/Install 400 Hz AC Generator Assembly

WP 0057, Test AC Generator

WP 0058, Remove/Install Contactor

WP 0059, Remove/Install Output Terminal Board

WP 0060, Remove/Install Voltage Selection Board

WP 0062, Remove/Install Transformers

WP 0063, Remove/Install Printed Circuit Board Module

WP 0065, Remove/Install Circuit Breaker

WP 0066, Remove/Install 50/60 Hz Engine Assembly

WP 0067, Remove/Install 400 Hz Engine Assembly

WP 0073, Remove/Install Fuel Rail

WP 0074, Test/Replace Fuel Injectors

WP 0075, Remove/Install High-Pressure Fuel Pump

WP 0076, Remove/Install Water Pump

WP 0079, Remove/Install Battery-Charging Alternator

WP 0080, Remove/Install Battery-Charging Alternator Belt

WP 0081, Remove/Install Engine ECM

WP 0087, Remove/Install Engine ECM Wiring Harness

WP 0088, Remove/Install Engine ECM Sensors

WP 0093, Test Engine Oil Pressure

WP 0100, General Maintenance

WP 0101, Remove/Install Harmonic Balancer

Foldout Pages

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**INITIAL SETUP — CONTINUED:**

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**ELECTRICAL SYSTEM TROUBLESHOOTING WITH A DCS CODE****WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator set is operating. Failure to comply may cause injury or death to personnel.
- DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

**NOTE**

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Read the entire corrective action sequence before beginning steps to complete corrective action for a malfunction.

FAULT RESET switch must be pushed to clear each DCS code as it is addressed.

**SYMPTOM**

[Fault 111: ECM Failure] displayed on DCS screen.

**MALFUNCTION**

ECM internal failure.

**CORRECTIVE ACTION**

Replace ECM (WP 0081, Remove/Install Engine ECM).

**SYMPTOM**

[Fault 115: Speed Signal Lost] displayed on DCS screen.

**MALFUNCTION**

Engine speed sensor(s) malfunction.

**CORRECTIVE ACTION****WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

**NOTE**

The main engine speed sensor (crankshaft position sensor) and the backup engine speed sensor (camshaft position sensor) are located in close proximity to one another. The same type of sensor is used in both locations. A P-clip on the engine wiring harness prohibits the harness connectors from being connected to the incorrect sensors. However, if the P-clip is omitted, it is possible to plug the wiring harness connectors into the incorrect sensors. If this occurs, the ECM will detect the problem and the engine will not start. Once the connector problem is corrected, the engine can be started and the fault code will become inactive.

- STEP 1. Inspect engine speed sensor plugs and verify that they are connected to proper connectors.
- STEP 2. Remove wiring connector(s) and install to proper sensor(s) as required (WP 0088, Remove/Install Engine ECM Sensors).
- STEP 3. If symptom continues, inspect engine speed sensors for loose wires, connections, and proper gap (WP 0088, Remove/Install Engine ECM Sensors).
- STEP 4. Replace engine speed sensor(s) as required (WP 0088, Remove/Install Engine ECM Sensors) and replace wiring as required (WP 0087, Remove/Install Engine ECM Wiring Harness).

**WARNING**

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

**NOTE**

Supply voltage is measured by measuring from supply pin 3 to return pin 2 with a multimeter set to VDC.

- STEP 5. If symptom continues, turn engine control switch to PRIME & RUN without starting generator set (TM 9-6115-752-10).

- STEP 6. Remove wiring connector and use a multimeter set to VDC to test supply voltage to speed sensors (Foldout Pages and WP 0100, General Maintenance).
- STEP 7. If reading is within 4.75 to 5.25 VDC range, proceed to STEP 9.
- STEP 8. If reading is not within 4.75 to 5.25 VDC range, proceed to STEP 17.
- STEP 9. Turn engine control switch to OFF (TM 9-6115-752-10).
- STEP 10. Remove and inspect the engine speed sensor for damaged sensor tip or physical signs of the sensor tip having touched moving component (WP 0088, Remove/Install Engine ECM Sensors).
- STEP 11. Replace or install as required, ensuring proper gap (WP 0088, Remove/Install Engine ECM Sensors).

### NOTE

Signal pin is pin 1 for camshaft and crankshaft speed sensor. Camshaft signal wire runs from camshaft speed sensor to ECM pin 37. Crankshaft signal wire runs from crankshaft speed sensor to ECM pin 42.

- STEP 12. If symptom continues, use wiring diagrams (Foldout Pages) and a multimeter set to test continuity (WP 0100, General Maintenance) to check engine speed sensor signal wire for opens or shorts.
- STEP 13. Repair or replace as required (WP 0100, General Maintenance and WP 0087, Remove/Install Engine ECM Wiring Harness).
- STEP 14. If symptom continues, inspect the harmonic balancer for damage or irregular spinning. Replace engine as required (WP 0101, Remove/Install Harmonic Balancer).
- STEP 15. If symptom continues, replace engine speed sensor (WP 0088, Remove/Install Engine ECM Sensors).
- STEP 16. If symptom continues, replace engine ECM (WP 0081, Remove/Install Engine ECM).
- STEP 17. Turn engine control switch to OFF (TM 9-6115-752-10).
- STEP 18. Check wiring harness and ECM for bent pins, corrosion, or other damage and replace or repair as required (WP 0087, Remove/Install Engine ECM Wiring Harness; WP 0081, Remove/Install Engine ECM; and WP 0100, General Maintenance).

### NOTE

ECM camshaft speed sensor supply pin is 36 and return pin is 48. ECM crankshaft speed sensor supply pin is 26 and return pin is 44.

- STEP 19. If symptom continues, use wiring diagrams (Foldout Pages) and a multimeter set to test VDC, remove ECM plug, and check supply voltage at ECM (WP 0100, General Maintenance).
- STEP 20. If voltage is within 4.75 to 5.25 VDC range, replace or repair wiring as required (WP 0100, General Maintenance and WP 0087, Remove/Install Engine ECM Wiring Harness).
- STEP 21. If voltage is not within 4.75 to 5.25 VDC range, replace ECM (WP 0081, Remove/Install Engine ECM).

**SYMPTOM**

[Fault 342: Calibration Code Failure] displayed on DCS screen.

**MALFUNCTION**

ECM conflict.

**CORRECTIVE ACTION**

STEP 1. Install or reinstall current calibration file to DCS (WP 0100, General Maintenance).

STEP 2. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

STEP 3. If symptom continues, replace ECM (WP 0081, Remove/Install Engine ECM).

**SYMPTOM**

[Fault 781: CAN Data Link Failure] displayed on DCS screen.

**MALFUNCTION**

ECM or DCS communication malfunction.

**CORRECTIVE ACTION****WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that soldiers working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.

STEP 1. Check for loose connections at DCS P3 and ECM J1939 connections (P102) (WP 0017, Remove/Install DCS; WP 0081, Remove/Install Engine ECM; and Foldout Pages).

STEP 2. Connect or tighten as required (WP 0017, Remove/Install DCS or WP 0081, Remove/Install Engine ECM).

**NOTE**

J114 must be disconnected from P111 to access pins A (J1939 HIGH) and B (J1939 LOW). Resistance specification is based on a reading from pin A to pin B in P111.

STEP 3. If symptom continues, remove battery ground cable (WP 0037, Remove/Install Batteries) and disconnect J114 from P111 at ECM (Foldout Pages).

STEP 4. Use wiring diagrams and a multimeter set to Ohms to check resistance of J1939 data link at P111 (DCS wires P3-K and P3-L) (WP 0100, General Maintenance and Foldout Pages).

- STEP 5. If resistance is within 50 to 70 Ohms range, connect J114 to P111 at ECM (Foldout Pages) and proceed to STEP 7.
- STEP 6. If resistance is not within 50 to 70 Ohms range, repair or replace engine wiring harness (P3-K and P3-L) (WP 0039, Remove/Install Engine Wiring Harness).
- STEP 7. Inspect connections and wires at J114, P102, and ECM pins for damage, moisture, or improper connections (Foldout Pages).
- STEP 8. Repair or replace connectors, ECM, or wires as required (WP 0039, Remove/Install Engine Wiring Harness; WP 0081, Remove/Install Engine ECM; and WP 0100, General Maintenance).
- STEP 9. If symptom continues, remove ECM plug P102 (WP 0039, Remove/Install Engine Wiring Harness).
- STEP 10. Use wiring diagrams and a multimeter set to test Ohms to measure the resistance between ECM P102 pin sleeves 46 and 47 (WP 0100, General Maintenance and Foldout Pages).
- STEP 11. If resistance is within 50 to 70 Ohms range, connect ECM plug P102 and proceed to STEP 13 (WP 0039, Remove/Install Engine Wiring Harness).
- STEP 12. If resistance is not within 50 to 70 Ohms range, replace or repair engine wiring harness (WP 0039, Remove/Install Engine Wiring Harness).
- STEP 13. Use wiring diagrams and a multimeter set to test Ohms to check for shorts and opens in ECM plug P102 (WP 0100, General Maintenance and Foldout Pages).
- STEP 14. Repair or replace engine wiring harness as required (WP 0100, General Maintenance and WP 0039, Remove/Install Engine Wiring Harness).
- STEP 15. If symptom continues, troubleshoot IAW [Warning 1117: Power Lost With Ignition On] displayed on DCS screen symptom.
- STEP 16. If symptom continues, replace ECM (WP 0081, Remove/Install Engine ECM).
- STEP 17. If symptom continues, test DCS and replace as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

## SYMPTOM

[Fault 1433: Local E-Stop] displayed on DCS screen.

## MALFUNCTION

Malfunctioning EMERGENCY STOP push button or malfunctioning DCS.

## CORRECTIVE ACTION

## WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. Ensure EMERGENCY STOP push button is pulled out and attempt to reset the fault code by pressing FAULT RESET switch.
- STEP 2. If symptom continues, test EMERGENCY STOP push button and replace as required (WP 0018, Repair DCS).



- STEP 3. If symptom continues, check DCS LEDs and replace DCS as required (WP 0017, Remove/Install DCS).

**SYMPTOM**

[Fault 1434: Remote E-Stop] displayed on DCS screen.

**MALFUNCTION**

Defective remote control cable, pins on DCS, or remote operating source.

**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. If operating from a remote source, ensure remote emergency stop was not intentionally activated from a remote source. Proceed to STEP 3.
- STEP 2. If not operating from a remote source, proceed to STEP 9.
- STEP 3. Confirm reason for use of remote emergency stop and continue normal operation as required.
- STEP 4. If remote emergency stop was not intentionally activated, restart computer and reconnect to DCS (TM 9-6115-752-10).
- STEP 5. If symptom continues, inspect remote control cable and computer for damaged, missing, or bent pins where connector of remote control cable attaches.
- STEP 6. Replace remote control cable or computer as required.
- STEP 7. If symptom continues, disconnect remote control cable and use a multimeter set to check continuity to test remote control cable for opens or shorts (WP 0100, General Maintenance).
- STEP 8. Replace remote control cable as required.
- STEP 9. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

**SYMPTOM**

[Fault 1445: Short Circuit] displayed on DCS screen.

**MALFUNCTION**

Load cables have been shorted or overloaded.

**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. Verify that load cables have been de-energized.
- STEP 2. Inspect load cables, load, and output box visually for signs of wire damage or short circuit. Repair or replace wires or components as required (WP 0059, Remove/Install Output Terminal Board; WP 0058, Remove/Install Contactor; WP 0060, Remove/Install Voltage Selection Board; and WP 0062, Remove/Install Transformers).
- STEP 3. If symptom continues, check operation by disconnecting load cables from generator set and restarting generator set (TM 9-6115-752-10).
- STEP 4. If generator set reaches rated speed without fault code shutdown, shutdown generator set, verify proper load, and connect load cables (TM 9-6115-752-10). Proceed to STEP 6.
- STEP 5. If generator set operation results in a fault code shutdown, proceed to STEP 8.
- STEP 6. If symptom continues, ensure load cables are completely disconnected and inspect load and load cables for shorts using a multimeter set to test continuity (WP 0100, General Maintenance). Replace as required.
- STEP 7. If symptom continues, compare load demands with generator set capacity and utilize a larger generator set if load is too great for current size generator set.

**WARNING**

Dangerously high voltage can exist across CT output with engine operating. CT can explode if disconnected from load with engine running. Do not disconnect CT with AC generator rotating. Failure to comply may cause injury or death to personnel by electrocution.

- STEP 8. If symptom continues, check CT for cracks or signs of heat damage, and resistance (WP 0062, Remove/Install Transformers). Replace as required (WP 0062, Remove/Install Transformers).
- STEP 9. If symptom continues, use wiring diagrams and inspect CT wires from CTs to printed circuit board module and from printed circuit board module to DCS for loose connections or damage (Foldout Pages).
- STEP 10. Repair or replace wiring as required (WP 0063, Remove/Install Printed Circuit Board Module; WP 0062, Remove/Install Transformers; WP 0017, Remove/Install DCS; and WP 0100, General Maintenance).
- STEP 11. Inspect wiring, connectors, and pins on connectors from the contactor to J511 on printed circuit board module for loose connections or damage (Foldout Pages). Replace as required (WP 0063, Remove/Install Printed Circuit Board Module).
- STEP 12. Inspect wiring running from contactor to output terminals and from contactor to voltage selection board for loose connections or damage. Repair or replace as required (WP 0058, Remove/Install Contactor and WP 0100, General Maintenance).
- STEP 13. Inspect busbars on contactor for damage and replace as required (WP 0058, Remove/Install Contactor).

STEP 14. Inspect wiring, connectors, and pins on connectors running from the DCS to printed circuit board module for loose connections and damage. Replace as required (WP 0063, Remove/Install Printed Circuit Board Module).

STEP 15. If symptom continues, test contactor for proper operation and replace as required (WP 0058, Remove/Install Contactor).

STEP 16. If symptom continues, check DCS LEDs and replace as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

## SYMPTOM

[Fault 1446: High AC Voltage] displayed on DCS screen.

## MALFUNCTION

Incorrect setting or shorted load.

## CORRECTIVE ACTION

## WARNING

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that soldiers working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.

STEP 1. Clear fault and restart generator set (TM 9-6115-752-10).

STEP 2. If symptom continues, check operation by disconnecting load cables from generator set and restarting generator set (TM 9-6115-752-10).

STEP 3. If generator set reaches rated speed without fault code shutdown, shutdown generator set, verify proper load, and connect load cables (TM 9-6115-752-10). Proceed to STEP 5.

STEP 4. If generator set operation results in a fault code shutdown, troubleshoot IAW [Fault 2335: Excitation Fault] displayed on DCS screen symptom.

STEP 5. Verify that voltage selection matches load requirements (TM 9-6115-752-10).

STEP 6. Adjust as required (TM 9-6115-752-10).

## WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

STEP 7. Inspect load cables and cables at output box for signs of wire damage.

STEP 8. Replace any damaged load cables.

- STEP 9. If symptom continues, check for use of large motors, inductive loads, AC air conditioning compressors, or other loads with large inrush currents.
- STEP 10. Reduce use of other loads while starting loads with large inrush currents and avoid sudden stopping of inrush current loads during operation.
- STEP 11. If symptom continues, ensure load cables are completely disconnected and inspect load and load cables for shorts and opens using a multimeter set to test continuity (WP 0100, General Maintenance). Repair or replace any damaged load cables.

## SYMPTOM

[Fault 1447: Low AC Voltage] displayed on DCS screen.

## MALFUNCTION

Overload, damage to wiring, or damage to DCS.

## CORRECTIVE ACTION

Troubleshoot IAW [Fault 1446: High AC Voltage] displayed on DCS screen symptom.

## SYMPTOM

[Fault 1448: Underfrequency] displayed on DCS screen.

## MALFUNCTION

Generator set was subjected to a reduction in speed for a period of time.

## CORRECTIVE ACTION

## WARNING

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
  - High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that soldiers working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.
- STEP 1. Clear fault and restart engine (TM 9-6115-752-10).
- STEP 2. If symptom continues, compare load demands with generator set and utilize a larger generator set if load is too great for current size generator set.
- STEP 3. If symptom continues, confirm proper voltage and frequency settings for load usage and adjust as required (TM 9-6115-752-10).
- STEP 4. If symptom continues, confirm proper speed sensor operation by troubleshooting IAW [Fault 115: Speed Signal Lost] displayed on DCS screen symptom.
- STEP 5. If symptom continues, troubleshoot engine system for fuel or air problems (poor performance) (WP 0011, Engine System Troubleshooting without a DCS Code).

## SYMPTOM

[Fault 1452: Genset Contactor Fail To Close] displayed on DCS screen.

## NOTE

DCS receives signal from contactor within 260 milliseconds of close operation indicating a closed contactor. [Fault 1452: Genset Contactor Fail To Close] displays on DCS screen when the DCS does not receive the signal or the contactor does not close.

## MALFUNCTION

Contactor or wiring malfunction.

## CORRECTIVE ACTION

## WARNING

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
  - High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that soldiers working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.
- STEP 1. Inspect wiring, connectors, and pins on connectors from the contactor to J511 on printed circuit board module for loose connections or damage (Foldout Pages). Replace as required (WP 0063, Remove/Install Printed Circuit Board Module).
  - STEP 2. Inspect wiring running from contactor to output terminals and from contactor to voltage selection board for loose connections or damage. Replace or repair as required (WP 0058, Remove/Install Contactor and WP 0100, General Maintenance).
  - STEP 3. Inspect busbars on contactor for damage and replace as required (WP 0058, Remove/Install Contactor).
  - STEP 4. Inspect wiring, connectors, and pins on connectors running from the DCS to printed circuit board module for loose connections and damage. Replace as required (WP 0063, Remove/Install Printed Circuit Board Module).
  - STEP 5. If symptom continues, test contactor for proper operation and replace as required (WP 0058, Remove/Install Contactor).

## NOTE

Wires P2-S and P2-F are contactor coil energizing wires from DCS P500 to printed circuit board module J500. Wires P3-H and P3-AA are contactor auxiliary wires (indicating to DCS when contactor is open or closed) from DCS P500 to printed circuit board module J500. Wires from the contactor (K1-Y, K1-X, K1-11, and K1-12) connect to printed circuit board module J511.

- STEP 6. If symptom continues, ensure battery ground cable is disconnected (WP 0037, Remove/Install Batteries), remove connectors, test all wiring for shorts or opens using wiring diagrams (Foldout Pages) and a multimeter set to test continuity (WP 0100, General Maintenance).

- STEP 7. Repair or replace any wiring as required and install connectors (WP 0100, General Maintenance; WP 0058, Remove/Install Contactor; WP 0063, Remove/Install Printed Circuit Board Module; and WP 0039, Remove/Install Engine Wiring Harness).
- STEP 8. If symptom continues, inspect the printed circuit board module and output terminal board for damage and replace as required (WP 0063, Remove/Install Printed Circuit Board Module and WP 0059, Remove/Install Output Terminal Board).
- STEP 9. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

## SYMPTOM

[Fault 1453: Genset Contactor Fail To Open] displayed on DCS screen.

## NOTE

The DCS receives a signal from the contactor within 1 sec of when it opens. [Fault 1453: Genset Contactor Fail To Open] displays on DCS screen when the DCS does not receive the signal or the contactor does not open.

## MALFUNCTION

Contactor or wiring malfunction.

## WARNING

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that soldiers working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.

## CORRECTIVE ACTION

- STEP 1. Remove output box components as required to access contactor with multimeter leads (WP 0058, Remove/Install Contactor).
- STEP 2. Turn engine control switch to PRIME & RUN without starting generator set (TM 9-6115-752-10).

## WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

## NOTE

Terminals X and Y on contactor are for the wires that energize the contactor coil.

- STEP 3. Test contactor coil for 24 VDC  $\pm$  5% using wiring diagrams and a multimeter set to test voltage (WP 0100, General Maintenance and Foldout Pages).
- STEP 4. If 24 VDC  $\pm$  5% is not detected on contactor coil, troubleshoot IAW [Fault 1452: Genset Contactor Fail To Close] displayed on DCS screen symptom.
- STEP 5. If 24 VDC  $\pm$  5% is detected on contactor coil, remove connectors, and test wiring from contactor, printed circuit board, and DCS for shorts or opens using wiring diagrams (Foldout Pages) and a multimeter set to test continuity (WP 0100, General Maintenance).
- STEP 6. Repair or replace any wiring as required and install connectors (WP 0100, General Maintenance; WP 0058, Remove/Install Contactor; WP 0063, Remove/Install Printed Circuit Board Module; and WP 0039, Remove/Install Engine Wiring Harness).
- STEP 7. If symptom continues, check DCS LEDs and replace DCS as required (WP 0017, Remove/Install DCS and WP 0018, Repair DCS).

## SYMPTOM

[Fault 1472: High Current] displayed on DCS screen.

## MALFUNCTION

Short, overload, or AC generator malfunction.

## CORRECTIVE ACTION

## WARNING

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that soldiers working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.
  - STEP 1. Compare load demands with generator set capacity and utilize a larger generator set if load is too great for current size generator set.
  - STEP 2. If symptom continues, shut down generator set if not already shut down and ensure load cables are completely disconnected (TM 9-6115-752-10).
  - STEP 3. Check the load and load cables for shorts or opens using a multimeter set to test continuity (WP 0100, General Maintenance). Remove load or repair as required.

STEP 4. Connect load and check for proper operation (TM 9-6115-752-10).

### **WARNING**

Dangerously high voltage can exist across CT output with engine operating. CT can explode if disconnected from load with engine running. Do not disconnect CT with AC generator rotating. Failure to comply may cause injury or death to personnel by electrocution.

- STEP 5. If symptom continues, check CT for cracks or signs of heat damage, and resistance (WP 0062, Remove/Install Transformers). Replace as required (WP 0062, Remove/Install Transformers).
- STEP 6. If symptom continues, use wiring diagrams and inspect CT wires from CTs to printed circuit board module and from printed circuit board module to DCS for loose connections or damage (Foldout Pages).
- STEP 7. Repair or replace wiring as required (WP 0063, Remove/Install Printed Circuit Board Module; WP 0062, Remove/Install Transformers; WP 0017, Remove/Install DCS; and WP 0100, General Maintenance).
- STEP 8. Inspect wiring, connectors, and pins on connectors from the contactor to J511 on printed circuit board module for loose connections or damage (Foldout Pages). Replace as required (WP 0063, Remove/Install Printed Circuit Board Module).
- STEP 9. Inspect wiring running from contactor to output terminals and from contactor to voltage selection board for loose connections or damage. Repair or replace as required (WP 0058, Remove/Install Contactor and WP 0100, General Maintenance).
- STEP 10. Inspect busbars on contactor for damage and replace as required (WP 0058, Remove/Install Contactor).
- STEP 11. Inspect wiring, connectors, and pins on connectors running from the DCS to printed circuit board module for loose connections and damage. Replace as required (WP 0063, Remove/Install Printed Circuit Board Module).
- STEP 12. If symptom continues, test contactor for proper operation and replace as required (WP 0058, Remove/Install Contactor).
- STEP 13. If symptom continues, test AC generator and replace as required (WP 0057, Test AC Generator and WP 0055, Remove/Install 50/60 Hz AC Generator Assembly or WP 0056, Remove/Install 400 Hz AC Generator Assembly).
- STEP 14. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

### **SYMPTOM**

[Fault 1257: Control Module ID Input State Failure] displayed on DCS screen.

### **MALFUNCTION**

ECM error or internal hardware failure.

### **CORRECTIVE ACTION**

- STEP 1. Verify ECM part number and replace ECM with correct ECM as required (WP 0081, Remove/Install Engine ECM).
- STEP 2. If symptom continues, replace ECM (WP 0081, Remove/Install Engine ECM).



## SYMPTOM

[Fault 1918: Fuel Level Low] displayed on DCS screen.

## NOTE

[Fault 1918: Fuel Level Low] indicates that there are approximately 4 min left (1% of fuel supply left) until the generator set will be out of fuel.

## MALFUNCTION

Low fuel level or fuel level sensor malfunction.

## CORRECTIVE ACTION

- STEP 1. Verify generator set fuel level and refill as required (WP 0044, Service Fuel System).
- STEP 2. If symptom continues, proceed to [Warning 2936: Fuel Level Sensor High] displayed on DCS screen symptom.

## SYMPTOM

[Fault 2335: Excitation Fault] displayed on DCS screen.

## MALFUNCTION

Circuit breaker, wiring, or AC generator malfunction.

## CORRECTIVE ACTION

## WARNING

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that soldiers working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.

## NOTE

400 Hz circuit breaker is only found on UOC 98M.

- STEP 1. Inspect circuit breaker CB 10 and CB 11 or 400 Hz circuit breaker and reset as required (WP 0038, Remove/Install Relay Panel or WP 0065, Remove/Install Circuit Breaker).
- STEP 2. Attempt restart (TM 9-6115-752-10).
- STEP 3. If restart fails or circuit breaker trips again, proceed to STEP 4.

## WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

## NOTE

Wires P1-A, P1-R, and P1-C run from DCS P1 through P500 which plugs into J500 on printed circuit board module. Wires P501-9, P501-5, and P501-11 run from J501 to P501 to contactor terminals A1 through C1 to sense generator set voltage.

- STEP 4. Use wiring diagrams (Foldout Pages) to locate and inspect wires from contactor (K1) to printed circuit board module J501 for damage, moisture, bent pins or connectors, or improper connections.
- STEP 5. Repair or replace wiring or connectors as required (WP 0100, General Maintenance).
- STEP 6. Use wiring diagrams (Foldout Pages) to locate and inspect wires P1-A, P1-R, and P1-C running from P500 and J500 on printed circuit board module to J1 and P1 of DCS for damage, moisture, bent pins or connectors, or improper connections.
- STEP 7. Repair or replace as required (WP 0100, General Maintenance).
- STEP 8. If symptom continues, ensure battery ground cable is removed (WP 0037, Remove/Install Batteries), remove connectors (WP 0063, Remove/Install Printed Circuit Board Module and WP 0058, Remove/Install Contactor), and check all wires inspected in STEP 4 and STEP 6 for shorts or opens using a multimeter set to test continuity (WP 0100, General Maintenance).
- STEP 9. Repair or replace as required and install connectors (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).

## NOTE

Wires P1-J and P1-K run to connector P90 from DCS (P1) to excite the AC alternator field. Wires P85-1 and P85-2 (quad circuit wires to sense AC generator voltage) run from the relay panel through plug P5D to the quad in the AC generator. Wires P1-L and P1-M run to P5D from the DCS (P1).

There are no quad circuit wires (P85-1 and P85-2) from the AC generator to the DCS on the 400 Hz generator sets (UOC 98M). DCS wires P1-L and P1-M run to a circuit breaker (CB 502) from voltage selection board (S501) terminals T7 and T8.

- STEP 10. If circuit breaker trips again, use wiring diagrams (Foldout Pages) to locate and check wires running from AC generator to plug P90 and to plug P85 for damage, moisture, bent pins or connectors, or improper connection.
- STEP 11. Repair or replace as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).

**NOTE**

STEPS 12 through 20 are for 50/60 Hz generator set troubleshooting and do not apply to 400 Hz generator sets (UOC 98M). Proceed to STEP 21 for additional troubleshooting of 400 Hz generator sets.

- STEP 12. If symptom continues, ensure battery ground cable is removed (WP 0037, Remove/Install Batteries), remove wiring connector, and test wires running from P85 to P5D (wires P85-1 and P85-2) at relay panel (Foldout Pages) for shorts or opens using a multimeter set to test continuity (WP 0100, General Maintenance).
- STEP 13. Replace or repair as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).
- STEP 14. Inspect P5D pins (A, B, G and H) and connector at relay panel (Foldout Pages) for damage to pins, poor connections, and moisture.
- STEP 15. Replace or repair wiring as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).
- STEP 16. If symptom continues, ensure battery ground cable is removed (WP 0037, Remove/Install Batteries) and remove connector to test wires running from P5D to DCS P1 (wires P1-L and P1-M) at relay panel (Foldout Pages) for shorts or opens using a multimeter set to test continuity (WP 0100, General Maintenance).
- STEP 17. Replace or repair wiring as required and install connector (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).
- STEP 18. Inspect P1 and J1 at DCS (Foldout Pages) for damage to pins, poor connections, and moisture.
- STEP 19. Replace or repair wiring as required and install connector (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).
- STEP 20. If circuit breaker(s) trips again, proceed to STEP 24.

**NOTE**

STEPS 21 through 23 apply to 400 Hz generator sets (UOC 98M).

- STEP 21. Ensure battery ground cable is removed (WP 0037, Remove/Install Batteries), remove wires from CB 502 (WP 0065, Remove/Install Circuit Breaker), and test wires P1-L and P1-M running to CB 502 (Foldout Pages) for shorts or opens using a multimeter set to test continuity (WP 0100, General Maintenance).
- STEP 22. Repair or replace wiring or connectors as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).
- STEP 23. If symptom continues, inspect voltage selection board for damage and replace as required (WP 0060, Remove/Install Voltage Selection Board).
- STEP 24. If symptom continues, test AC generator and replace AC generator as required (WP 0057, Test AC Generator and WP 0055, Remove/Install 50/60 Hz AC Generator Assembly or WP 0056, Remove/Install 400 Hz AC Generator Assembly).
- STEP 25. If symptom continues, troubleshoot engine for poor performance (WP 0011, Engine System Troubleshooting without a DCS Code).
- STEP 26. If symptom continues, check DCS LEDs for proper function (DS1100 for proper AVR function) and replace DCS as required (WP 0017, Remove/Install DCS).

STEP 27. If symptom continues, replace AC generator as required (WP 0057, Test AC Generator and WP 0055, Remove/Install 50/60 Hz AC Generator Assembly or WP 0056, Remove/Install 400 Hz AC Generator Assembly).

**SYMPTOM**

[Fault 2914: Genset AC Meter Failed] displayed on DCS screen.

**MALFUNCTION**

Generator set AC meter failure.

**CORRECTIVE ACTION**

Check DCS LEDs and replace DCS as required or if symptom continues (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

**SYMPTOM**

[Fault 2972: Field Overload] displayed on DCS screen.

**MALFUNCTION**

Faulty alternator components or AVR.

**CORRECTIVE ACTION**

Troubleshoot IAW [Fault 2335: Excitation Fault] displayed on DCS screen symptom.

**SYMPTOM**

[Fault 3664: Invalid Genset Configuration] displayed on DCS screen.

**MALFUNCTION**

Incorrect dip switch settings, wiring malfunction, or improper engine or AC generator combination.

**CORRECTIVE ACTION****WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that personnel working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.

STEP 1. Check position of dip switches against settings recorded during removal or replacement and see if there is an incorrect setting (WP 0063, Remove/Install Printed Circuit Board Module).

- STEP 2. Check dip switch settings against table and illustration in WP 0063, Remove/Install Printed Circuit Board Module.
- STEP 3. Move dip switch(es) to correct setting as required (WP 0063, Remove/Install Printed Circuit Board Module).

### NOTE

Wires P3-m, P3-n, P3-s, P3-GG, P3-LL, and P3-MM are for dip switch settings. They are pins or sleeves 20, 28, 38, 39, 40, and 50 on P3, J3, P500, and J500.

- STEP 4. If symptom continues, use wiring diagrams to find and inspect wires, pins, sleeves, and connectors on DCS P3 and plug P500 to J500 on printed circuit board module for damage to pins or sleeves, poor connections, and moisture (Foldout Pages).
- STEP 5. Replace or repair any wires, connectors, or pins as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).
- STEP 6. If symptom continues, ensure battery ground cable is disconnected (WP 0037, Remove/Install Batteries), remove connectors, and use wiring diagrams (Foldout Pages) to check wiring inspected in STEP 4 for shorts and opens using a multimeter set to test continuity (WP 0100, General Maintenance).
- STEP 7. Repair or replace any wires, connectors, or pins as required and install connectors (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).
- STEP 8. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).
- STEP 9. If symptom continues, replace printed circuit board module (WP 0063, Remove/Install Printed Circuit Board Module).

### SYMPTOM

[Fault 3665: Invalid Voltage Configuration] displayed on DCS screen.

### NOTE

[Fault 3665: Invalid Voltage Configuration] appears on DCS screen if an invalid voltage selection board change is made or some other fault or invalid selection occurs when generator set is not running.

### MALFUNCTION

Voltage selection fault.

### CORRECTIVE ACTION

### WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. Examine the position of the voltage selection board to determine that it is at desired voltage configuration and fasteners are to correct torque (WP 0060, Remove/Install Voltage Selection Board).

- STEP 2. Move voltage selection board to the desired voltage position and tighten fasteners as required (WP 0060, Remove/Install Voltage Selection Board and TM 9-6115-752-10).
- STEP 3. If symptom continues, use wiring diagrams to confirm voltage selection board is wired correctly (Foldout Pages).
- STEP 4. Adjust wiring as required (WP 0060, Remove/Install Voltage Selection Board).
- STEP 5. If symptom continues, check connections and wiring from plug P503 to AUX CONTACT connector on printed circuit board module for damage to pins or sleeves, poor connections, or moisture.
- STEP 6. Repair or replace as required (WP 0063, Remove/Install Printed Circuit Board Module and WP 0100, General Maintenance).
- STEP 7. If symptom continues, ensure battery ground cable is disconnected (WP 0037, Remove/Install Batteries), remove wires as required and test wires P503-1 and P503-2 running to voltage selection board AUX 1 and 2 (S501-AUX) for opens or shorts using wiring diagrams and a multimeter set to test continuity (WP 0100, General Maintenance and Foldout Pages).
- STEP 8. Replace or repair wiring as required and install wires (WP 0060, Remove/Install Voltage Selection Board and WP 0100, General Maintenance).
- STEP 9. If symptom continues, inspect voltage selection board and replace as required (WP 0060, Remove/Install Voltage Selection Board).
- STEP 10. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

## SYMPTOM

[Fault 3668: Output Voltage Configuration Bit 0 Changed] or [Fault 3669: Output Voltage Configuration Bit 1 Changed] displayed on DCS screen.

## NOTE

[Fault 3668: Output Voltage Configuration Bit 0 Changed] or [Fault 3669: Output Voltage Configuration Bit 1 Changed] appears on DCS screen when a change occurs while generator set is running (e.g., wire vibrating loose).

## MALFUNCTION

Voltage selection fault.

## CORRECTIVE ACTION

Troubleshoot IAW [Fault 3665: Invalid Voltage Configuration] displayed on DCS screen symptom.

## SYMPTOM

[Fault 3673: Convenience Receptacle AC Meter Failed] displayed on DCS screen.

## MALFUNCTION

Convenience receptacle AC meter failed.

**CORRECTIVE ACTION**

Check DCS LEDs and replace DCS as required or if symptom continues (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

**SYMPTOM**

[Fault 3677: Genset Config Factory Test Fault] displayed on DCS screen.

**MALFUNCTION**

Factory calibration error.

**CORRECTIVE ACTION**

Replace DCS (WP 0017, Remove/Install DCS).

**SYMPTOM**

[Warning 121: Speed Signal Error] displayed on DCS screen.

**MALFUNCTION**

Camshaft or crankshaft speed sensor problem.

**CORRECTIVE ACTION**

Troubleshoot IAW symptom [Fault 115: Speed Signal Lost] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 122: Intake Manifold Pressure Sensor High] displayed on DCS screen.

**MALFUNCTION**

Voltage above normal or shorted to a high source.

**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

STEP 1. Check wiring connections to ensure that they are seated securely into connection ends at intake manifold and ECM. Reseat wiring connections into connection ends if necessary (WP 0087, Remove/Install Engine ECM Wiring Harness and WP 0088, Remove/Install Engine ECM Sensors).

STEP 2. If symptom continues, inspect wiring connections at intake manifold and ECM for damage to pins or wires.

- STEP 3. If damage to pins or wires is found, replace or repair as required (WP 0087, Remove/Install Engine ECM Wiring Harness; WP 0088, Remove/Install Engine ECM Sensors; and WP 0100, General Maintenance).

### WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

### NOTE

Intake manifold pressure/temperature sensor is connected to the ECM wiring harness. Pin 3 on the ECM intake manifold connector on wiring harness supplies 5 VDC to the sensor. Pin 1 is the return pin for the sensor. Pin 4 on ECM harness and sensor is the signal pin to ECM pin 19 for the pressure signal.

- STEP 4. If symptom continues, turn engine control switch to PRIME & RUN without starting generator set and remove intake manifold pressure/temperature sensor connector (TM 9-6115-752-10).
- STEP 5. Use a multimeter set to measure VDC to check voltage from supply pin 3 of the connector on ECM wiring harness to return pin 1 at the sensor connector of the ECM wiring harness (WP 0100, General Maintenance and Foldout Pages).
- STEP 6. If voltage is within 4.75 VDC to 5.25 VDC range, proceed to STEP 8.
- STEP 7. If voltage is not within 4.75 VDC to 5.25 VDC range, reinstall connector and proceed to STEP 12.
- STEP 8. Turn engine control switch to OFF (TM 9-6115-752-10).
- STEP 9. Using wiring diagrams and a multimeter set to test continuity, check signal wire for opens or shorts (WP 0100, General Maintenance and Foldout Pages).
- STEP 10. Repair or replace ECM wiring harness as required (WP 0100, General Maintenance and WP 0087, Remove/Install Engine ECM Wiring Harness).
- STEP 11. If symptom continues, replace the intake manifold pressure/temperature sensor (WP 0088, Remove/Install Engine ECM Sensors).

### NOTE

The ECM supplies voltage to the intake manifold pressure/temperature sensor. Pin 36 on the ECM supplies 5 VDC to the sensor circuit. Pin 48 is the return pin for the sensor circuit.

- STEP 12. Remove ECM plug at ECM and use a multimeter set to measure VDC to check voltage from the ECM supply pin 36 to return pin 48 at ECM (WP 0100, General Maintenance and Foldout Pages).
- STEP 13. If voltage is within 4.75 VDC to 5.25 VDC range, proceed to STEP 15.
- STEP 14. If voltage is not within 4.75 VDC to 5.25 VDC range, replace ECM (WP 0081, Remove/Install Engine ECM).
- STEP 15. Turn engine control switch to OFF (TM 9-6115-752-10), ensure battery ground cable is removed (WP 0037, Remove/Install Batteries), and use wiring diagrams and a multimeter set to test continuity to check ECM wiring harness for opens or shorts (WP 0100, General Maintenance and Foldout Pages).
- STEP 16. Repair or replace ECM wiring harness as required (WP 0100, General Maintenance and WP 0087, Remove/Install Engine ECM Wiring Harness).



## SYMPTOM

[Warning 123: Intake Manifold Pressure Sensor Low] displayed on DCS screen.

## MALFUNCTION

Voltage below normal or shorted to a low source.

## CORRECTIVE ACTION

Troubleshoot IAW [Warning 122: Intake Manifold Pressure Sensor High] displayed on DCS screen symptom.

## SYMPTOM

[Warning 135: Oil Pressure Sensor High] displayed on DCS screen.

## MALFUNCTION

Voltage above normal or shorted to a high source.

## CORRECTIVE ACTION

## WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. Check wiring connections to ensure that they are seated securely into connection ends at oil pressure sender and DCS. Reseat wiring connections into connection ends if necessary (WP 0017, Remove/Install DCS and WP 0093, Test Engine Oil Pressure).
- STEP 2. If symptom continues, inspect wiring connections at oil pressure sensor and DCS for damage to pins or wires.
- STEP 3. If damage to pins or wires is found, repair or replace as required (WP 0017, Remove/Install DCS; WP 0093, Test Engine Oil Pressure; and WP 0100, General Maintenance).

## NOTE

Resistance of oil pressure sender is measured from pin B (supply voltage) to pin C (signal) of oil pressure sender.

- STEP 4. If symptom continues, remove wire connector (WP 0093, Test Engine Oil Pressure) and test oil pressure sender for correct resistance using a multimeter set to test Ohms (WP 0100, General Maintenance).
- STEP 5. Replace oil pressure sender if value is more than 100,000  $\Omega$  or approximately zero  $\Omega$  (WP 0093, Test Engine Oil Pressure).

## WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

## NOTE

The oil pressure sender (P40) runs directly to the DCS. P3-f carries 5 VDC to the oil pressure sender, P3-g is the signal wire, and P3-k is the return. All wires enter the DCS through plug P3 (pins B, C, and A) to DCS J3.

- STEP 6. If symptom continues, turn engine control switch to PRIME & RUN (TM 9-6115-752-10), remove wiring connector, and test supply voltage to oil pressure sender using a multimeter set to test VDC (WP 0100, General Maintenance).
- STEP 7. If supply voltage is within 4.75 VDC to 5.25 VDC range, proceed to STEP 11.
- STEP 8. If supply voltage is not within 4.75 VDC to 5.25 VDC range, turn engine control switch to OFF and check engine wiring harness for shorts and opens using a multimeter set to test continuity (WP 0100, General Maintenance and TM 9-6115-752-10).
- STEP 9. Repair or replace engine wiring harness as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).
- STEP 10. If symptom continues, replace engine wiring harness (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).
- STEP 11. If symptom continues, turn engine control switch to OFF if not already in OFF position, ensure battery ground cable is disconnected (WP 0037, Remove/Install Batteries), and use a multimeter set to test continuity to check signal wire P3-g for opens or shorts (WP 0100, General Maintenance and TM 9-6115-752-10).
- STEP 12. Repair or replace wiring as required and install connector (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).
- STEP 13. If symptom continues, replace oil pressure sender if not already replaced as a result of STEP 5 (WP 0093, Test Engine Oil Pressure).
- STEP 14. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

## SYMPTOM

[Warning 141: Oil Pressure Sensor Low] displayed on DCS screen.

## MALFUNCTION

Voltage below normal or shorted to a low source.

## CORRECTIVE ACTION

## NOTE

The troubleshooting procedures for DCS code 141 are IAW DCS code 135. The difference between the two codes is the type of short, resulting in low voltage for DCS code 141 or high voltage for DCS code 135.

Troubleshoot IAW [Warning 135: Oil Pressure Sensor High] displayed on DCS screen symptom.

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**SYMPTOM**

[Warning 144: Coolant Temp Sensor OOR High] displayed on DCS screen.

**NOTE**

[Warning 144: Coolant Temp Sensor OOR High] displayed on DCS screen indicates high signal voltage and/or a short to a high source. [Warning 145: Coolant Temp Sensor OOR Low] displayed on DCS screen indicates low signal voltage and/or a short to a low source (ground/return ground). A shorted return can cause multiple fault or warning codes to be active on the DCS screen.

ECM temperature sensor reports operating coolant temperature data and is linked to Warnings 144 and 145.

**MALFUNCTION**

Defective temperature sensor or wiring.

**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. Check wiring connections to ensure that they are seated securely into connection ends at coolant temperature sensor and ECM. Reseat wiring connections into connection ends if necessary (WP 0087, Remove/Install Engine ECM Wiring Harness and WP 0076, Remove/Install Water Pump).
- STEP 2. If symptom continues, inspect wiring connections at coolant temperature sensor and ECM for damage to pins or wires.
- STEP 3. If damage to pins or wires is found, replace or repair as required (WP 0087, Remove/Install Engine ECM Wiring Harness; WP 0076, Remove/Install Water Pump; and WP 0100, General Maintenance).
- STEP 4. If symptom continues, test ECM temperature sensor (WP 0076, Remove/Install Water Pump).
- STEP 5. Replace ECM temperature sensor if found defective (WP 0088, Remove/Install Engine ECM Sensors).
- STEP 6. If not defective, proceed to STEP 7.

## WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

## NOTE

Coolant temperature sensor connector attaches to ECM wiring harness through plug with pins/sleeves A (return) and B (signal). Coolant temperature sensor ECM wiring harness enters ECM through pins 49 (engine coolant temperature signal) and 47 (sensor return number 1) of ECM engine wiring harness.

- STEP 7. Remove ECM plug from coolant temperature sensor and turn engine control switch to PRIME & RUN without starting generator set (TM 9-6115-752-10).
- STEP 8. Test supply voltage to ECM coolant temperature sensor using wiring diagrams and a multimeter set to test VDC (WP 0087, Remove/Install Engine ECM Wiring Harness; WP 0100, General Maintenance; and Foldout Pages).
- STEP 9. If supply voltage is within 4.75 VDC to 5.25 VDC range, proceed to STEP 13.
- STEP 10. If supply voltage is not within 4.75 VDC to 5.25 VDC range, remove ECM connector at ECM and use wiring diagrams and a multimeter set to test VDC to check ECM pins 49 and 47 for proper voltage (WP 0100, General Maintenance and Foldout Pages).
- STEP 11. If voltage at ECM is within 4.75 VDC to 5.25 VDC range, turn engine control switch to OFF and repair or replace ECM wiring harness (WP 0087, Remove/Install Engine ECM Wiring Harness and TM 9-6115-752-10).
- STEP 12. If voltage at ECM is not within 4.75 VDC to 5.25 VDC range, turn engine control switch to OFF and replace ECM (WP 0081, Remove/Install Engine ECM and TM 9-6115-752-10).
- STEP 13. Turn engine control switch to OFF and replace coolant temperature sensor if not already replaced as a result of STEP 5 (WP 0088, Remove/Install Engine ECM Sensors and TM 9-6115-752-10).
- STEP 14. If symptom continues, check DCS LEDs (WP 0018, Repair DCS).
- STEP 15. Replace DCS as required (WP 0017, Remove/Install DCS).
- STEP 16. If symptom continues, replace ECM (WP 0081, Remove/Install Engine ECM).

## SYMPTOM

[Warning 145: Coolant Temperature Sensor OOR Low] displayed on DCS screen.

## MALFUNCTION

Defective temperature sensor or wiring.

## CORRECTIVE ACTION

Troubleshoot IAW [Warning 144: Coolant Temp Sensor OOR High] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 153: Intake Manifold Temperature Sensor High] displayed on DCS screen.

**MALFUNCTION**

Defective temperature sensor or wiring.

**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. Check wiring connections to ensure that they are seated securely into connection ends at intake manifold and ECM. Reseat wiring connections into connection ends if necessary (WP 0087, Remove/Install Engine ECM Wiring Harness and WP 0088, Remove/Install Engine ECM Sensors).
- STEP 2. If symptom continues, inspect wiring connections at intake manifold and ECM for damage to pins or wires.
- STEP 3. If damage to pins or wires is found, replace or repair as required (WP 0087, Remove/Install Engine ECM Wiring Harness; WP 0088, Remove/Install Engine ECM Sensors; and WP 0100, General Maintenance).
- STEP 4. If symptom continues, using wiring diagrams and a multimeter set to test Ohms, remove connector and check intake manifold pressure/temperature sensor pins 1 and 2 at intake manifold pressure/temperature sensor for resistance (WP 0100, General Maintenance and Foldout Pages).
- STEP 5. Compare readings to Table 1 and replace sensor if any reading is outside of specification (WP 0088, Remove/Install Engine ECM Sensors).

**Table 1. Intake Manifold Pressure/Temperature Sensor Resistance.**

DEGREES (°F (°C))	RESISTANCE (OHMS)
59 (15)	3100
68 (20)	2450
77 (25)	2010
86 (30)	1670

## WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

## NOTE

Intake manifold pressure/temperature sensor is connected to the ECM wiring harness. Pin 3 on the ECM intake manifold connector on wiring harness supplies 5 VDC to the sensor. Pin 1 is the return pin for the sensor. Pin 2 on ECM harness and sensor is the signal pin to ECM pin 11 for the temperature signal.

- STEP 6. If symptom continues, turn engine control switch to PRIME & RUN without starting generator set (TM 9-6115-752-10).
- STEP 7. Use a multimeter set to measure VDC to check voltage from supply pin 3 of the connector on ECM wiring harness to return pin 1 at the sensor connector of the ECM wiring harness (WP 0100, General Maintenance and Foldout Pages).
- STEP 8. If voltage is within 4.75 VDC to 5.25 VDC range, proceed to STEP 10.
- STEP 9. If voltage is not within 4.75 VDC to 5.25 VDC range, install connector at intake manifold pressure/temperature sensor and proceed to STEP 13.
- STEP 10. Turn engine control switch to OFF and use wiring diagrams and a multimeter set to test continuity to check signal wire for opens or shorts (WP 0100, General Maintenance; Foldout Pages; and TM 9-6115-752-10).
- STEP 11. Repair or replace ECM wiring harness as required (WP 0100, General Maintenance and WP 0087, Remove/Install Engine ECM Wiring Harness).
- STEP 12. If symptom continues, replace the intake manifold pressure/temperature sensor if not already replaced in STEP 5 (WP 0088, Remove/Install Engine ECM Sensors).

## NOTE

The ECM supplies voltage to the intake manifold pressure/temperature sensor. Pin 36 on the ECM supplies 5 VDC to the sensor circuit. Pin 48 is the return pin for the sensor circuit.

- STEP 13. Remove connector at ECM and use a multimeter set to measure VDC to check voltage from the ECM supply pin 36 to return pin 48 at ECM (WP 0100, General Maintenance and Foldout Pages).
- STEP 14. If voltage is within 4.75 VDC to 5.25 VDC range, proceed to STEP 16.
- STEP 15. If voltage is not within 4.75 VDC to 5.25 VDC range, turn engine control switch to OFF and replace ECM (WP 0081, Remove/Install Engine ECM and TM 9-6115-752-10).
- STEP 16. Turn engine control switch to OFF and use wiring diagrams and a multimeter set to test continuity to check ECM wiring harness for opens or shorts (WP 0100, General Maintenance and Foldout Pages).
- STEP 17. Repair or replace ECM wiring harness as required (WP 0100, General Maintenance and WP 0087, Remove/Install Engine ECM Wiring Harness).

## SYMPTOM

[Warning 154: Intake Manifold Temperature Sensor Low] displayed on DCS screen.

**MALFUNCTION**

Defective temperature sensor or wiring.

**CORRECTIVE ACTION**

Troubleshoot IAW [Warning 153: Intake Manifold Temperature Sensor High] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 221: Ambient Air Pressure Sensor High] displayed on DCS screen.

**MALFUNCTION**

Defective ambient air sensor or wiring.

**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. Check wiring connections to ensure that they are seated securely into connection ends at ambient air pressure sensor and ECM. Reseat wiring connections into connection ends if necessary (WP 0087, Remove/Install Engine ECM Wiring Harness and WP 0088, Remove/Install Engine ECM Sensors).
- STEP 2. Inspect wiring connections at ambient air pressure sensor and ECM for damage to pins or wires.
- STEP 3. If damage to pins or wires is found, replace or repair as required (WP 0087, Remove/Install Engine ECM Wiring Harness; WP 0088, Remove/Install Engine ECM Sensors; and WP 0100, General Maintenance).

**WARNING**

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

- STEP 4. If symptom continues, turn engine control switch to PRIME & RUN without starting generator set and remove ambient air pressure sensor connector at the sensor (TM 9-6115-752-10).
- STEP 5. Use wiring diagrams and a multimeter set to test VDC to check supply voltage to ambient air pressure sensor from ECM wiring harness sensor connector pin 3 to return pin 1 (WP 0100, General Maintenance and Foldout Pages).
- STEP 6. If value is within 4.75 to 5.25 VDC range, proceed to STEP 11.
- STEP 7. If value is outside of 4.75 to 5.25 VDC range, proceed to STEP 8.

- STEP 8. Use wiring diagrams and a multimeter set to test VDC, remove connector at ECM, and check sensor voltage at ECM from ECM supply pin 36 to ECM return pin 48 (WP 0100, General Maintenance and Foldout Pages).
- STEP 9. If value is within 4.75 to 5.25 VDC range, turn engine control switch to OFF and replace ECM wiring harness (WP 0087, Remove/Install Engine ECM Wiring Harness and TM 9-6115-752-10).
- STEP 10. If value is outside of 4.75 to 5.25 VDC range, turn engine control switch to OFF and replace ECM (WP 0081, Remove/Install Engine ECM and TM 9-6115-752-10).
- STEP 11. Turn engine control switch to OFF, remove battery ground cable, and use wiring diagrams and a multimeter set to test continuity to check signal pin 2 in ECM wiring harness for opens or shorts (WP 0037, Remove/Install Batteries; WP 0100, General Maintenance; Foldout Pages; and TM 9-6115-752-10).
- STEP 12. Replace or repair as required (WP 0087, Remove/Install Engine ECM Wiring Harness)
- STEP 13. If symptom continues, replace ambient air pressure sensor (WP 0088, Remove/Install Engine ECM Sensors).
- STEP 14. If symptom continues, replace ECM (WP 0081, Remove/Install Engine ECM).

## SYMPTOM

[Warning 222: Air Pressure Sensor Low] displayed on DCS screen.

### MALFUNCTION

Defective ambient air sensor or wiring.

### CORRECTIVE ACTION

Troubleshoot IAW [Warning 221: Ambient Air Pressure Sensor High] displayed on DCS screen symptom.

## SYMPTOM

[Warning 238: Sensor Supply 3 Low] displayed on DCS screen.

### MALFUNCTION

Defective engine speed sensor, wiring, or ECM.



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**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

**NOTE**

Sensor Supply 3 provides supply voltage for the crankshaft engine speed sensor through ECM pin 16.

- STEP 1. Check wiring connections to ensure that they are seated securely into connection ends at crankshaft engine speed sensor and ECM (WP 0087, Remove/Install Engine ECM Wiring Harness).
- STEP 2. Reseat wiring connections into connection ends if necessary (WP 0087, Remove/Install Engine ECM Wiring Harness and WP 0088, Remove/Install Engine ECM Sensors).
- STEP 3. If symptom continues, inspect wiring connections at crankshaft engine speed sensor and ECM for damage to pins, corrosion, missing seals, or damaged wires.
- STEP 4. If damage to pins or wires is found, replace or repair as required. Replace missing seals as required (WP 0087, Remove/Install Engine ECM Wiring Harness; WP 0088, Remove/Install Engine ECM Sensors; and WP 0100, General Maintenance).

**WARNING**

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

- STEP 5. If symptom continues, turn engine control switch to PRIME & RUN without starting generator set and remove crankshaft speed sensor connector at sensor (TM 9-6115-752-10).
- STEP 6. Use wiring diagrams and a multimeter set to test VDC to check supply voltage (pin 3) and return voltage (pin 2) at sensor connector harness (WP 0100, General Maintenance and Foldout Pages).
- STEP 7. If supply voltage is within 4.75 to 5.25 VDC range, proceed to STEP 12.
- STEP 8. If supply voltage is not within 4.75 to 5.25 VDC range, install connector to crankshaft speed sensor and proceed to STEP 9.
- STEP 9. Remove ECM connector at ECM and use wiring diagrams and a multimeter set to test VDC to check sensor voltage at ECM from ECM supply pin 26 to ECM return pin 44 (WP 0100, General Maintenance and Foldout Pages).
- STEP 10. If value is within 4.75 to 5.25 VDC range, turn engine control switch to OFF and repair or replace ECM wiring harness (WP 0087, Remove/Install Engine ECM Wiring Harness and TM 9-6115-752-10).
- STEP 11. If value is outside of 4.75 to 5.25 VDC range, turn engine control switch to OFF and replace ECM (WP 0081, Remove/Install Engine ECM and TM 9-6115-752-10).

STEP 12. Turn engine control switch to OFF and use wiring diagrams and a multimeter set to test continuity to check signal pin 1 in ECM wiring harness for opens or shorts (WP 0100, General Maintenance; Foldout Pages; and TM 9-6115-752-10).

STEP 13. Replace or repair wiring harness as required (WP 0087, Remove/Install Engine ECM Wiring Harness).

STEP 14. If symptom continues, replace crankshaft engine speed sensor (WP 0088, Remove/Install Engine ECM Sensors).

STEP 15. If symptom continues, replace ECM (WP 0081, Remove/Install Engine ECM).

## **SYMPTOM**

[Warning 239: Sensor Supply 3 High] displayed on DCS screen.

## **MALFUNCTION**

Defective engine speed sensor, wiring, or ECM.

## **CORRECTIVE ACTION**

Troubleshoot crankshaft speed sensor IAW [Warning 238: Sensor Supply 3 Low] displayed on DCS screen symptom.

## **SYMPTOM**

[Warning 271: Fuel Pressure Solenoid Valve Low] displayed on DCS screen.

## **NOTE**

DCS code 2311 may display with DCS codes 271 or 272. If DCS code 2311 displays, follow appropriate troubleshooting steps for DCS code 2311 ([Warning 2311: Fuel Injection Control Valve Failure] displayed on DCS screen symptom).

It may be necessary to place main DC circuit breaker in OFF/TRIP position and then RESET→ON before being able to clear the DCS codes after troubleshooting (TM 9-6115-752-10). After cycling the main DC circuit breaker, the ECM will retest for the cause of the DCS code. The ECM driver is activated at power on. If the cause is no longer present, the DCS code will be able to be cleared or will not display.

## **MALFUNCTION**

Defective fuel pump actuator, wiring, or ECM.

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**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. Check wiring connections to ensure that they are seated securely into connection ends of engine ECM wiring harness at fuel pump actuator and ECM. Tighten wires into connection ends if necessary (WP 0087, Remove/Install Engine ECM Wiring Harness).
- STEP 2. If symptom continues, inspect wiring connections of engine ECM wiring harness at fuel pump actuator and ECM for damage to pins or wires.
- STEP 3. If damage to pins or wires is found, repair or replace as required (WP 0087, Remove/Install Engine ECM Wiring Harness and WP 0100, General Maintenance).
- STEP 4. If symptom continues, remove connector at high-pressure fuel pump and use wiring diagrams and a multimeter to check for a short to ground between fuel pump actuator signal pin 1 and a ground (WP 0100, General Maintenance and Foldout Pages).
- STEP 5. If resistance is low (approximately less than 10) or zero Ohms, replace high-pressure fuel pump (WP 0075, Remove/Install High-Pressure Fuel Pump).
- STEP 6. If resistance is high (approximately 100, 000) or infinite Ohms, proceed to STEP 7.

**WARNING**

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

**NOTE**

Fuel pump actuator signal pin connects to engine ECM wiring harness through pin 1 and runs from ECM pin 10. Fuel pump actuator return pin connects to engine ECM wiring harness through pin 2 and runs to ECM pin 14.

- STEP 7. Turn engine control switch to PRIME & RUN without starting generator set (TM 9-6115-752-10).
- STEP 8. Use wiring diagrams and a multimeter set to test VDC to check supply voltage from pin 1 to pin 2 in ECM wiring harness at fuel actuator (WP 0100, General Maintenance and Foldout Pages).
- STEP 9. If supply voltage is within 2.85 to 3.15 VDC range, proceed to STEP 14.
- STEP 10. If supply voltage is not within 2.85 to 3.15 VDC range, install connector at high-pressure fuel pump and proceed to STEP 11.
- STEP 11. Remove ECM connector at ECM and use wiring diagrams and a multimeter set to test VDC to check engine ECM supply voltage at ECM pin 2 to ground on engine ECM (Foldout Pages and WP 0100, General Maintenance).
- STEP 12. If voltage is within 2.85 to 3.15 VDC range at ECM, proceed to STEP 14.

- STEP 13. If voltage is not within 2.85 to 3.15 VDC range at ECM, turn engine control switch to OFF and replace ECM (WP 0081, Remove/Install Engine ECM and TM 9-6115-752-10).
- STEP 14. Turn engine control switch to OFF and test engine ECM wiring harness for shorts and opens using wiring diagrams and a multimeter set to test continuity (WP 0100, General Maintenance; Foldout Pages; WP 0087, Remove/Install Engine ECM Wiring Harness; and TM 9-6115-752-10).
- STEP 15. Replace or repair ECM wiring harness as required (WP 0087, Remove/Install Engine ECM Wiring Harness and WP 0100, General Maintenance).
- STEP 16. If symptom continues, replace high-pressure fuel pump (WP 0075, Remove/Install High-Pressure Fuel Pump).
- STEP 17. If symptom continues, replace ECM (WP 0081, Remove/Install Engine ECM).

**SYMPTOM**

[Warning 272: Fuel Pressure Solenoid Valve High] displayed on DCS screen.

**MALFUNCTION**

Electrical or communication error.

**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

**NOTE**

Fuel pump actuator wires (from pins 1 (signal) and 2 (return)) run to pins 10 and 14 on ECM connector.

- STEP 1. Check plug at fuel pump actuator for loose connections, corrosion, or other damage.
- STEP 2. Repair or replace as required (WP 0100, General Maintenance and WP 0087, Remove/Install Engine ECM Wiring Harness).
- STEP 3. If symptom continues, remove connector at high-pressure fuel pump and use wiring diagrams and a multimeter set to test Ohms to check the resistance between the fuel pump actuator signal pin and return pin at the actuator (WP 0100, General Maintenance and Foldout Pages).
- STEP 4. If resistance reading is outside 2.0 to 4.5 Ohms range, replace high-pressure fuel pump (WP 0075, Remove/Install High-Pressure Fuel Pump).
- STEP 5. If resistance reading is within 2.0 to 4.5 Ohms range, proceed to STEP 7 of [Warning 271: Fuel Pressure Solenoid Valve Low] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 285: CAN Multiplex PGN Rate Error] displayed on DCS screen.

**MALFUNCTION**

ECM or DCS communication malfunction.

**CORRECTIVE ACTION**

Troubleshoot IAW [Fault 781: CAN Data Link Failure] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 286: CAN Multiplex Calibration Error] displayed on DCS screen.

**MALFUNCTION**

ECM or DCS communication malfunction.

**CORRECTIVE ACTION**

Troubleshoot IAW [Fault 781: CAN Data Link Failure] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 295: Ambient Air Pressure Sensor Error] displayed on DCS screen.

**NOTE**

At PRIME & RUN before the engine starts, the sensor readings for intake manifold pressure and engine oil pressure are compared with the ambient air pressure. DCS code 295 occurs if the ambient air pressure sensor reading is different from the other two. This check is only done once after the keyswitch at ECM is turned on when going to PRIME & RUN.

**MALFUNCTION**

Defective ambient air sensor or wiring.

**CORRECTIVE ACTION**

Troubleshoot IAW [Warning 221: Ambient Air Pressure Sensor High] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 322: Injector Solenoid 1 Low Current] displayed on DCS screen.

**MALFUNCTION**

Below normal current or open circuit.

**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

**NOTE**

Troubleshooting procedures below are to check for low voltage problems associated with DCS codes 322, 324, 331, and 332.

- STEP 1. Use wiring diagrams (Foldout Pages) to locate and check ECM wiring harness running from ECM to fuel injector for damage, moisture, dirt, bent pins or connectors, or improper connections at ECM and fuel injector connector (WP 0087, Remove/Install Engine ECM Wiring Harness).
- STEP 2. Repair connectors, clean connectors, or install connectors properly if damaged or installed improperly (WP 0087, Remove/Install Engine ECM Wiring Harness and WP 0100, General Maintenance).
- STEP 3. If symptom continues, remove ECM wiring harness from ECM (WP 0087, Remove/Install Engine ECM Wiring Harness).

**NOTE**

Fuel injector 1 uses ECM harness driver pin 57 and ECM harness return pin 53, fuel injector 2 uses ECM harness driver pin 45 and ECM harness return pin 58, fuel injector 3 uses ECM harness driver pin 55 and ECM harness return pin 59, and fuel injector 4 uses ECM harness driver pin 56 and ECM harness return pin 51.

- STEP 4. Remove ECM connector at ECM and use wiring diagrams and a multimeter set to Ohms to check ECM wiring harness resistance at ECM end between the cylinder driver pin and the cylinder return pin on the ECM connector (WP 0100, General Maintenance and Foldout Pages).
- STEP 5. If resistance is within 0.5 to 1.5  $\Omega$  range, proceed to STEP 7.
- STEP 6. If resistance is not within 0.5 to 1.5  $\Omega$  range, proceed to STEP 13.

## CAUTION

Ensure fuel injectors are tagged and labeled according to the cylinder from which they were removed. When reused, fuel injectors must be reinstalled in the cylinders from which they were removed. Failure to comply may cause damage to equipment.

- STEP 7. Install ECM connector and confirm whether fault is due to fuel injector or ECM by switching suspected faulty fuel injector with another engine fuel injector (WP 0074, Test/Replace Fuel Injectors).
- STEP 8. Install ECM wiring harness to ECM (WP 0087, Remove/Install Engine ECM Wiring Harness).
- STEP 9. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
- STEP 10. If no DCS code or a different DCS code is experienced, turn engine control switch to OFF (TM 9-6115-752-10) and replace original fuel injector with a new fuel injector and return switched fuel injector back to correct cylinder (WP 0074, Test/Replace Fuel Injector). Resume operation.
- STEP 11. If the same fuel injector DCS code that first appeared is experienced again, turn engine control switch to OFF (TM 9-6115-752-10) and use a multimeter set to test continuity to check ECM wiring harness for shorts or opens. Repair or replace as required (WP 0087, Remove/Install Engine ECM Wiring Harness).
- STEP 12. If symptom continues, replace ECM (WP 0081, Remove/Install Engine ECM).
- STEP 13. Install ECM connector at ECM, remove connector at fuel injector, and use wiring diagrams and a multimeter set to test Ohms to measure the resistance between the driver pin and return pin at the fuel injector (WP 0100, General Maintenance and Foldout Pages).
- STEP 14. If resistance at fuel injector is within 0.5 Ohms to 1.5 Ohms range, use a multimeter set to test continuity to check ECM wiring harness for shorts or opens. Repair or replace as required (WP 0087, Remove/Install Engine ECM Wiring Harness).
- STEP 15. If resistance at fuel injector is not within 0.5 Ohms to 1.5 Ohms range, replace fuel injector (WP 0074, Test/Replace Fuel Injector).
- STEP 16. If symptom continues, replace ECM (WP 0081, Remove/Install Engine ECM).

## SYMPTOM

[Warning 319: Real Time Clock Error] displayed on DCS screen.

## MALFUNCTION

Clock no longer accurate due to temporary power loss or backup battery failure.

## CORRECTIVE ACTION

- STEP 1. Reset clock IAW TM 9-6115-752-10.
- STEP 2. If symptom continues, remove DCS control panel assembly (WP 0018, Repair DCS) to check for loose backup battery and secure as required.
- STEP 3. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

**SYMPTOM**

[Warning 324: Injector Solenoid 3 Low Current] displayed on DCS screen.

**MALFUNCTION**

Below normal current or open circuit.

**CORRECTIVE ACTION**

Troubleshoot IAW [Warning 322: Injector Solenoid 1 Low Current] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 331: Injector Solenoid 2 Low Current] displayed on DCS screen.

**MALFUNCTION**

Below normal current or open circuit.

**CORRECTIVE ACTION**

Troubleshoot IAW [Warning 322: Injector Solenoid 1 Low Current] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 332: Injector Solenoid 4 Low Current] displayed on DCS screen.

**MALFUNCTION**

Below normal current or open circuit.

**CORRECTIVE ACTION**

Troubleshoot IAW [Warning 322: Injector Solenoid 1 Low Current] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 343: ECM Hardware Failure].

**MALFUNCTION**

ECM internal failure.

**CORRECTIVE ACTION**

Replace ECM (WP 0081, Remove/Install Engine ECM).

**SYMPTOM**

[Warning 351: Injector Power Supply Failure] displayed on DCS screen.



**MALFUNCTION**

Battery power not available to energize power supply.

**CORRECTIVE ACTION**

STEP 1. Check for DCS codes 322, 324, 331, and 332 on DCS screen (TM 9-6115-752-10) and troubleshoot IAW DCS codes if present.

STEP 2. If symptom continues or only DCS code 351 is on DCS screen, proceed to [Warning 1117: Power Lost With Ignition On] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 352: Sensor Supply 1 Low] displayed on DCS screen.

**MALFUNCTION**

Defective ECM sensor(s), wiring, or ECM.

**CORRECTIVE ACTION****NOTE**

Sensor Supply 1 provides supply voltage and return for the camshaft speed sensor, fuel rail pressure sensor, barometric air pressure sensor, and the intake manifold pressure/temperature sensor through ECM pins 36 (supply) and 48 (return).

Troubleshoot IAW [Warning 386: Sensor Supply 1 High] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 386: Sensor Supply 1 High] displayed on DCS screen.

**MALFUNCTION**

Defective ECM sensor(s), wiring, or ECM.

**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

**NOTE**

Sensor Supply 1 provides supply voltage and return for the camshaft speed sensor, fuel rail pressure sensor, barometric air pressure sensor, and the intake manifold pressure/temperature sensor through ECM pins 36 (supply) and 48 (return).

- STEP 1. Check wiring connections to ensure that they are seated securely into connection ends at intake manifold pressure/temperature sensor, barometric pressure sensor, fuel rail pressure sensor, camshaft speed sensor, and ECM. Reseat wiring connections into connection ends if necessary (WP 0087, Remove/Install Engine ECM Wiring Harness; WP 0073, Remove/Install Fuel Rail; and WP 0088, Remove/Install Engine ECM Sensors).
- STEP 2. If symptom continues, inspect wiring connections at intake manifold pressure/temperature sensor, barometric pressure sensor, fuel rail pressure sensor, camshaft speed sensor, and ECM for damage to pins, corrosion, missing seals, or damaged wires.
- STEP 3. If damage to pins or wires is found, replace or repair as required. Replace missing seals as required (WP 0087, Remove/Install Engine ECM Wiring Harness; WP 0088, Remove/Install Engine ECM Sensors; and WP 0100, General Maintenance).

**WARNING**

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

- STEP 4. Turn engine control switch to PRIME & RUN without starting generator set and disconnect connector at ECM (WP 0087, Remove/Install Engine ECM Wiring Harness and TM 9-6115-752-10).
- STEP 5. Use a multimeter set to VDC and wiring diagrams to check supply and return voltage at ECM pins 36 and 48 (WP 0100, General Maintenance and Foldout Pages).
- STEP 6. If measurement is within 4.75 to 5.25 VDC range, proceed to STEP 8.
- STEP 7. If measurement is outside 4.75 to 5.25 VDC range, turn engine control switch to OFF and replace ECM (WP 0081, Remove/Install Engine ECM and TM 9-6115-752-10).
- STEP 8. Turn engine control switch to OFF, install connector at ECM (WP 0087, Remove/Install Engine ECM Wiring Harness and TM 9-6115-752-10), and troubleshoot IAW other DCS codes related to the sensors ([Fault 115: Speed Signal Lost] displayed on DCS screen, [Warning 122: Intake Manifold Pressure Sensor High] displayed on DCS screen, [Warning 153: Intake Manifold Temperature Sensor High] displayed on DCS screen, [Warning 221: Ambient Air Pressure Sensor High] displayed on DCS screen, [Warning 451: Injector Metering Rail 1 Pressure: High Voltage] displayed on DCS screen).
- STEP 9. If symptom continues, replace ECM (WP 0081, Remove/Install Engine ECM).

**SYMPTOM**

[Warning 427: CAN Data Link Degraded] displayed on DCS screen.

**MALFUNCTION**

ECM or DSC communication malfunction.

**CORRECTIVE ACTION**

Troubleshoot IAW [Fault 781: CAN Data Link Failure] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 435: Oil Pressure Switch Error] displayed on DCS screen.

**MALFUNCTION**

Oil pressure switch or wiring error.

**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. Check wiring connections to ensure that they are seated securely into connection ends at oil pressure switch and ECM (WP 0087, Remove/Install Engine ECM Wiring Harness).
- STEP 2. Reseat wiring connections into connection ends if necessary (WP 0087, Remove/Install Engine ECM Wiring Harness and WP 0088, Remove/Install Engine ECM Sensors).
- STEP 3. If symptom continues, inspect wiring connections at oil pressure switch and ECM for damage to pins, corrosion, missing seals, or damaged wires.
- STEP 4. If damage to pins or wires is found, replace or repair as required. Replace missing seals as required (WP 0087, Remove/Install Engine ECM Wiring Harness; WP 0088, Remove/Install Engine ECM Sensors; and WP 0100, General Maintenance).
- STEP 5. If symptom continues, remove connector at oil pressure switch and use wiring diagrams and a multimeter set to test Ohms to measure resistance of oil pressure switch pin 1 and a ground (WP 0100, General Maintenance and Foldout Pages).
- STEP 6. If infinite or high resistance (100,000 Ohms or greater) is measured, replace oil pressure switch (WP 0088, Remove/Install Engine ECM Sensors).
- STEP 7. If no or low resistance (10 Ohms or less) is measured, proceed to STEP 8.

**NOTE**

Oil pressure switch uses ECM signal pin 32.

STEP 8. Use wiring diagrams and a multimeter set to test continuity to check ECM wiring harness for opens or shorts (WP 0100, General Maintenance and Foldout Pages).

STEP 9. Replace or repair as required (WP 0087, Remove/Install Engine ECM Wiring Harness and WP 0100, General Maintenance).

STEP 10. If symptom continues, replace ECM (WP 0081, Remove/Install Engine ECM).

**SYMPTOM**

[Warning 441: Low Battery Voltage] displayed on DCS screen.

**MALFUNCTION**

Battery or charging failure.

**CORRECTIVE ACTION**

Troubleshoot IAW [Warning 1442: Weak Battery] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 442: High Battery Voltage] displayed on DCS screen.

**MALFUNCTION**

Alternator or DCS failure.

**CORRECTIVE ACTION**

STEP 1. Test battery-charging alternator assembly and replace as required (WP 0079, Remove/Install Battery-Charging Alternator).

STEP 2. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

**SYMPTOM**

[Warning 451: Injector Metering Rail 1 Pressure: High Voltage] displayed on DCS screen.

**MALFUNCTION**

Wiring, sensor, or ECM malfunction.

**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

**NOTE**

If DCS code [Warning 386: Sensor Supply 1 High] displays on DCS screen simultaneously with [Warning 451: Injector Metering Rail 1 Pressure: High Voltage], troubleshoot IAW [Warning 386: Sensor Supply 1 High] before troubleshooting DCS code [Warning 451: Injector Metering Rail 1 Pressure: High Voltage].

- STEP 1. Check wiring connections to ensure that they are seated securely into connection ends at fuel rail pressure sensor and ECM (WP 0087, Remove/Install Engine ECM Wiring Harness and WP 0073, Remove/Install Fuel Rail).
- STEP 2. Reseat wiring connections into connection ends if necessary (WP 0087, Remove/Install Engine ECM Wiring Harness and WP 0088, Remove/Install Engine ECM Sensors).
- STEP 3. If symptom continues, inspect wiring connections at fuel rail pressure sensor and ECM for damage to pins, corrosion, missing seals, or damaged wires.
- STEP 4. If damage to pins or wires is found, replace or repair as required. Replace missing seals as required (WP 0073, Remove/Install Fuel Rail; WP 0087, Remove/Install Engine ECM Wiring Harness; WP 0088, Remove/Install Engine ECM Sensors; and WP 0100, General Maintenance).

**WARNING**

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

**NOTE**

ECM pin 36 is the supply voltage pin and ECM pin 48 is the return voltage pin. Pin 3 is the voltage supply pin at the sensor and pin 1 is the return pin at the sensor.

- STEP 5. Turn engine control switch to PRIME & RUN without starting generator set and remove connector at fuel rail pressure sensor (TM 9-6115-752-10).
- STEP 6. Use wiring diagrams and a multimeter set to test VDC to check for proper voltage at ECM wiring harness to fuel rail pressure sensor (Foldout Pages and WP 0100, General Maintenance).
- STEP 7. If reading is within 4.75 to 5.25 VDC range, proceed to STEP 9.
- STEP 8. If reading is outside 4.75 to 5.25 VDC range, proceed to STEP 14.
- STEP 9. Turn engine control switch to OFF and test ECM wiring harness pin 2 at fuel rail pressure sensor and pin 29 at ECM wiring harness for opens or shorts using wiring diagrams and a multimeter set to test continuity (Foldout Pages; WP 0100, General Maintenance; and TM 9-6115-752-10).
- STEP 10. Repair or replace as required (WP 0087, Remove/Install Engine ECM Wiring Harness).

STEP 11.If symptom continues, replace fuel rail pressure sensor (WP 0073, Remove/Install Fuel Rail).

STEP 12.If symptom continues, replace ECM (WP 0081, Remove/Install Engine ECM).

STEP 13.Install connector to fuel rail pressure sensor, remove ECM connector at ECM, and use wiring diagrams and a multimeter set to test VDC to check for proper voltage at ECM pins 36 and 48 (Foldout Pages and WP 0100, General Maintenance).

STEP 14.If reading is within 4.75 to 5.25 VDC range, proceed to STEP 16.

STEP 15.If reading is outside 4.75 to 5.25 VDC range, turn engine control switch to OFF and replace ECM (WP 0081, Remove/Install Engine ECM and TM 9-6115-752-10).

STEP 16.Turn engine control switch to OFF and check ECM wiring harness for opens or shorts using wiring diagrams and a multimeter set to test continuity (WP 0087, Remove/Install Engine ECM Wiring Harness and TM 9-6115-752-10).

STEP 17.Repair or replace the ECM wiring harness as required (WP 0087, Remove/Install Engine ECM Wiring Harness).

## **SYMPTOM**

[Warning 452: Injector Metering Rail 1 Pressure: Low Voltage] displayed on DCS screen.

### **MALFUNCTION**

Wiring, sensor, or ECM malfunction.

### **CORRECTIVE ACTION**

## **NOTE**

If DCS code [Warning 352: Sensor Supply 1 Low] displays on DCS screen simultaneously with [Warning 452: Injector Metering Rail 1 Pressure: Low Voltage], troubleshoot IAW [Warning 352: Sensor Supply 1 Low] before troubleshooting DCS code [Warning 452: Injector Metering Rail 1 Pressure: Low Voltage].

Troubleshoot IAW [Warning 451: Injector Metering Rail 1 Pressure: High Voltage] displayed on DCS screen symptom.

## **SYMPTOM**

[Warning 496: Speed Sensor Supply Voltage Error] displayed on DCS screen.

### **MALFUNCTION**

Camshaft position sensor error.

### **CORRECTIVE ACTION**

Proceed to STEP 3 of [Fault 115: Speed Signal Lost] displayed on DCS screen symptom and troubleshoot camshaft engine speed sensor for malfunctions IAW corrective action steps.

**SYMPTOM**

[Warning 554: APC Pressure Error] displayed on DCS screen.

**MALFUNCTION**

Fuel rail pressure sensor malfunction.

**CORRECTIVE ACTION**

Troubleshoot IAW [Warning 451: Injector Metering Rail 1 Pressure: High Voltage] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 689: Crankshaft Speed Error] displayed on DCS screen.

**MALFUNCTION**

Crankshaft engine speed sensor error.

**CORRECTIVE ACTION**

Proceed to STEP 3 of [Fault 115: Speed Signal Lost] displayed on DCS screen symptom and troubleshoot crankshaft engine speed sensor for malfunctions IAW corrective action steps.

**SYMPTOM**

[Warning 697: ECM Temp High] displayed on DCS screen.

**MALFUNCTION**

ECM internal failure.

**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

STEP 1. Verify ECM part number and replace as required (WP 0081, Remove/Install Engine ECM).

**NOTE**

The ECM temperature sensor is located internally to the ECM. No troubleshooting is possible if the DCS code is unable to be cleared.

STEP 2. If symptom continues, replace ECM (WP 0081, Remove/Install Engine ECM).

**SYMPTOM**

[Warning 698: ECM Temp Low] displayed on DCS screen.

**MALFUNCTION**

ECM internal failure.

**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

STEP 1. Verify ECM part number and replace as required (WP 0081, Remove/Install Engine ECM).

**NOTE**

The ECM temperature sensor is located internally to the ECM. No troubleshooting is possible if the DCS code is unable to be cleared.

STEP 2. If symptom continues, replace ECM (WP 0081, Remove/Install Engine ECM).

**SYMPTOM**

[Warning 757: ECM Data Lost] displayed on DCS screen.

**MALFUNCTION**

ECM power supply malfunction.

**CORRECTIVE ACTION**

Troubleshoot IAW [Warning 1117: Power Lost With Ignition On] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 782: CAN Data Link Failure] displayed on DCS screen.

**MALFUNCTION**

CAN data link malfunction.

**CORRECTIVE ACTION**

Troubleshoot IAW [Fault 781: CAN Data Link Failure] displayed on DCS screen symptom.



## SYMPTOM

[Warning 1117: Power Lost With Ignition On] displayed on DCS screen.

## MALFUNCTION

Power supply malfunction.

## CORRECTIVE ACTION

### WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. Inspect P101 of engine wiring harness at ECM for loose connections, corroded pins, moisture, or other signs of damage (WP 0039, Remove/Install Engine Wiring Harness and Foldout Pages).
- STEP 2. Connect, repair, or replace as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).
- STEP 3. If symptom continues, check that DCS screen powers on when engine control switch is placed into PRIME & RUN (TM 9-6115-752-10).
- STEP 4. If DCS does not power on, proceed to DCS indicates no power available and no lighted display symptom (WP 0009, Electrical System Troubleshooting without a DCS Code).

### WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

- STEP 5. If DCS powers on, leave DCS engine control switch set at PRIME & RUN without starting generator set and unplug P101 at ECM. Proceed to next step.
- STEP 6. Use wiring diagrams and a multimeter set to test VDC to check P5C-H and P5B-C for at least 20 VDC (Foldout Pages and WP 0100, General Maintenance).
- STEP 7. If 20 VDC or greater is measured, turn engine control switch OFF (TM 9-6115-752-10), install P101 connector and proceed to [Warning 2545: Keyswitch Reset Required] displayed on DCS screen symptom.
- STEP 8. If less than 20 VDC is measured, install P101 connector and confirm battery voltage is at proper value using DCS screen and by testing batteries using a multimeter set to measure VDC (TM 9-6115-752-10 and WP 0037, Remove/Install Batteries).
- STEP 9. Charge or replace batteries as required (WP 0037, Remove/Install Batteries).
- STEP 10. If symptom continues, turn engine control switch to OFF (TM 9-6115-752-10) and check CB6 and relay K16 and K17 for proper operation and reset or replace as required (WP 0038, Remove/Install Relay Panel).

STEP 11. If symptom continues, use wiring diagrams and a multimeter set to test continuity to check for an open circuit in P5B-C and P5C-H from relay panel to ECM (WP 0039, Remove/Install Engine Wiring Harness; Foldout Pages; and WP 0100, General Maintenance).

STEP 12. Repair or replace as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).

### WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

STEP 13. If symptom continues, turn engine control switch to PRIME & RUN without starting generator set (TM 9-6115-752-10), remove connector P5B-D at relay panel, and use wiring diagrams and a multimeter set to test VDC to check voltage at DCS wires P3-W to ground and P2-L to ground.

STEP 14. If less than 20 VDC is measured at one or both wires, proceed to STEP 16.

STEP 15. If 20 VDC or greater is measured at both wires, replace ECM (WP 0081, Remove/Install Engine ECM).

STEP 16. Remove battery ground cable (WP 0037, Remove/Install Batteries) and use wiring diagrams and a multimeter set to test continuity to check DCS wires P3-W and P2-L to relay panel (P5B-D) for opens or shorts (WP 0039, Remove/Install Engine Wiring Harness; Foldout Pages; and WP 0100, General Maintenance).

STEP 17. Repair or replace as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).

STEP 18. If symptom continues, replace ECM (WP 0081, Remove/Install Engine ECM).

### SYMPTOM

[Warning 1131: Battle Short Active] displayed on DCS screen.

### MALFUNCTION

BATTLESHORT switch malfunction.

### CORRECTIVE ACTION

### WARNING

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

STEP 1. Ensure BATTLESHORT switch is in OFF position (TM 9-6115-752-10).

STEP 2. If BATTLESHORT is ON, determine reason for use and switch OFF as required (TM 9-6115-752-10).

STEP 3. If symptom continues, test BATTLESHORT switch and replace as required (WP 0018, Repair DCS).

STEP 4. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

### **SYMPTOM**

[Warning 1376: Camshaft Speed Error] displayed on DCS screen.

### **MALFUNCTION**

Camshaft position sensor error.

### **CORRECTIVE ACTION**

Proceed to STEP 3 of [Fault 115: Speed Signal Lost] displayed on DCS screen symptom and troubleshoot camshaft engine speed sensor for malfunctions IAW corrective action steps.

### **SYMPTOM**

[Warning 1417: Power Down Failure] displayed on DCS screen.

### **MALFUNCTION**

DCS malfunction.

### **CORRECTIVE ACTION**

Check DCS LEDs replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

### **SYMPTOM**

[Warning 1441: Low Fuel Level] displayed on DCS screen.

### **NOTE**

[Fault 1441: Fuel Level Low] indicates that there is 5% of fuel supply left until the generator set will be out of fuel.

### **MALFUNCTION**

Low fuel level or sensor malfunction.

### **CORRECTIVE ACTION**

Troubleshoot IAW [Fault 1918: Fuel Level Low] displayed on DCS screen symptom.

### **SYMPTOM**

[Warning 1442: Weak Battery] displayed on DCS screen.

**NOTE**

[Warning 1442: Weak Battery] displays when battery voltage is below 14.4 V. [Warning 441: Low Battery Voltage] displays when battery voltage is below 21 V.

**MALFUNCTION**

Battery connections are loose or batteries are insufficiently charged.

**CORRECTIVE ACTION****WARNING**

Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.

- STEP 1. Check for corroded or loose battery connections. Clean/replace corroded battery connections and tighten loose battery connections as required (WP 0037, Remove/Install Batteries).
- STEP 2. If symptom continues, test batteries (WP 0037, Remove/Install Batteries).
- STEP 3. Charge batteries, start engine utilizing the NATO slave receptacle and an outside power source, or replace batteries as required (WP 0037, Remove/Install Batteries and WP 0100, General Maintenance).
- STEP 4. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Loose belt, defective battery-charging alternator or tensioner, or defective electrical component.

**CORRECTIVE ACTION**

- STEP 1. Check for loose battery-charging alternator belt or malfunctioning belt tensioner and tighten belt or replace belt or belt tensioner as required (WP 0080, Remove/Install Battery-Charging Alternator Belt).
- STEP 2. Observe DCS [Battery] [Adc] indicator to ensure battery-charging alternator is charging batteries properly (TM 9-6115-752-10).
- STEP 3. Test battery-charging alternator if batteries are not charging properly and replace as required (WP 0079, Remove/Install Battery-Charging Alternator).
- STEP 4. If symptom continues, check DCS LEDs (WP 0018, Repair DCS) and replace as required (WP 0017, Remove/Install DCS).

**SYMPTOM**

[Warning 1444: KW Overload] displayed on DCS screen.

**MALFUNCTION**

Load cable or wiring malfunction.

**CORRECTIVE ACTION**

Troubleshoot IAW [Fault 1445: Short Circuit] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 1449: Overfrequency] displayed on DCS screen.

**MALFUNCTION**

Generator AC output frequency is high.

**CORRECTIVE ACTION****WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- Ensure power is disconnected from whatever component is being repaired. Always check for power before attempting any other form of troubleshooting. Be sure to notify someone when working on electrical equipment. Never work alone or without someone else knowing that electrical equipment is involved. Failure to comply may cause injury or death to personnel.
- High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that soldiers working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.

STEP 1. Check for sudden reduction in load demands. Adjust governor gain as required (WP 0017, Remove/Install DCS).

STEP 2. If symptom continues, ensure load cables are completely disconnected and check for shorts or opens in the load using a multimeter set to test continuity (WP 0100, General Maintenance).

STEP 3. Replace or repair load components as required.

STEP 4. If symptom continues, check frequency, voltage selection, and voltage settings on DCS (TM 9-6115-752-10).

STEP 5. If incorrect, adjust settings as required (TM 9-6115-752-10).

STEP 6. If symptom continues, troubleshoot IAW [Fault 115: Speed Signal Lost] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 1451: Genset/Bus Voltage Mismatch] displayed on DCS screen.

**MALFUNCTION**

DCS fault.

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**CORRECTIVE ACTION****WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

**NOTE**

[Warning 1451: Genset/Bus Voltage Mismatch] indicates a calibration error with the metering circuits on the DCS. The offset in the meters can be hand-calibrated using InPower AMMPS software.

If [Warning 1451: Genset/Bus Voltage Mismatch] is hardware and not calibration-error related, there was an extreme voltage drop through the contactor and/or its connections. A damaged contactor, poor connections in the output box between the bus sense voltage and generator sense voltage, or a poor DCS harness connection could cause the warning.

STEP 1. If operating in parallel, ensure all generator sets in parallel are shut down. If not operating in parallel proceed to STEP 3.

STEP 2. Check connections between generators and ensure voltage and frequency of generator sets are at the same settings (TM 9-6115-752-10).

**NOTE**

Wires P1-A, P1-R, and P1-C run from DCS P1 through P500 which plugs into J500 on printed circuit board module. Wires P501-9, P501-5, and P501-11 run from J501 to P501 to contactor terminals A1 through C1 to sense generator set voltage.

STEP 3. If symptom continues, check for loose voltage sense connections at DCS, printed circuit board module, and contactor (Foldout Pages). Tighten as required.

STEP 4. If symptom continues, use wiring diagrams (Foldout Pages) to locate and inspect wires from contactor (K1) to printed circuit board module J501 for damage, moisture, bent pins or connectors, or improper connections.

STEP 5. Repair or replace wiring or connectors as required (WP 0100, General Maintenance).

STEP 6. If symptom continues, use wiring diagrams (Foldout Pages) to locate and inspect wires P1-A, P1-R, and P1-C running from P500 and J500 on printed circuit board module to J1 and P1 of DCS for damage, moisture, bent pins or connectors, or improper connections.

STEP 7. Repair or replace wiring or connectors as required (WP 0100, General Maintenance).

STEP 8. If symptom continues, ensure battery ground cable is removed (WP 0037, Remove/Install Batteries), remove wires as required, and check all wires inspected in STEP 4 and STEP 6 for shorts or opens using a multimeter set to test continuity (WP 0100, General Maintenance).

STEP 9. Repair or replace wiring as required and install wires (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).

STEP 10.If symptom continues, test contactor and replace as required (WP 0058, Remove/Install Contactor).

STEP 11.If symptom continues, adjust offset in voltage metering circuits in DCS using InPower AMMPS software (WP 0100, General Maintenance) until mismatch is resolved.

STEP 12.If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

## **SYMPTOM**

[Warning 1469: Speed/Hz Mismatch] displayed on DCS screen.

### **MALFUNCTION**

Speed sensor error.

### **CORRECTIVE ACTION**

Troubleshoot IAW [Fault 115: Speed Signal Lost] displayed on DCS screen symptom.

## **SYMPTOM**

[Warning 1471: High Current Warning] displayed on DCS screen.

### **MALFUNCTION**

Short, overload, or AC generator malfunction.

### **CORRECTIVE ACTION**

Troubleshoot IAW [Fault 1472: High Current] displayed on DCS screen symptom.

## **SYMPTOM**

[Warning 1689: Reset Real Time Clock] displayed on DCS screen.

### **MALFUNCTION**

Clock no longer accurate due to temporary power loss or backup battery failure.

### **CORRECTIVE ACTION**

STEP 1. Reset clock IAW TM 9-6115-752-10.

STEP 2. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

## **SYMPTOM**

[Warning 1845: Water In Fuel Sensor OOR High] displayed on DCS screen.

### **MALFUNCTION**

Water in fuel sensor shorted high.

**CORRECTIVE ACTION**

Troubleshoot IAW [Warning 418: High Water In Fuel] displayed on DCS screen symptom (WP 0010, Engine System Troubleshooting with a DCS Code).

**SYMPTOM**

[Warning 1846: Water In Fuel Sensor OOR Low] displayed on DCS screen.

**MALFUNCTION**

Water in fuel sensor shorted low.

**CORRECTIVE ACTION**

Troubleshoot IAW [Warning 418: High Water In Fuel] displayed on DCS screen symptom (WP 0010, Engine System Troubleshooting with a DCS Code).

**SYMPTOM**

[Warning 2311: Fuel Injection Control Valve Failure] displayed on DCS screen.

**MALFUNCTION**

Electrical or communication error.

**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

**NOTE**

Fuel pump actuator wires (from pins 1 (signal) and 2 (return)) run to pins 10 and 14 on ECM connector.

- STEP 1. Check plug at fuel pump actuator for loose connections, corrosion, or other damage.
- STEP 2. Repair or replace as required (WP 0100, General Maintenance and WP 0087, Remove/Install Engine ECM Wiring Harness).
- STEP 3. If symptom continues, remove connector at high-pressure fuel pump and use wiring diagrams and a multimeter set to test Ohms to check the resistance between the fuel pump actuator signal pin and return pin at the actuator (WP 0100, General Maintenance and Foldout Pages).
- STEP 4. If resistance reading is not within 2.0 to 4.5  $\Omega$  range, replace high-pressure fuel pump (WP 0075, Remove/Install High-Pressure Fuel Pump).
- STEP 5. If resistance reading is within 2.0 to 4.5  $\Omega$  range, use wiring diagrams and a multimeter to check the resistance between the fuel pump actuator signal pin and an engine or generator set ground (WP 0100, General Maintenance and Foldout Pages).



- STEP 6. If resistance is less than 100,000  $\Omega$ , replace high-pressure fuel pump (WP 0075, Remove/Install High-Pressure Fuel Pump).
- STEP 7. If resistance is 100,000  $\Omega$  or greater, check ECM harness for damage, corrosion, or loose connections.
- STEP 8. Replace or repair as required (WP 0100, General Maintenance and WP 0087, Remove/Install Engine ECM Wiring Harness).
- STEP 9. If symptom continues, check for shorts or opens in ECM wiring harness using wiring diagrams and a multimeter set to test continuity (WP 0100, General Maintenance and Foldout Pages).
- STEP 10. Replace or repair as required (WP 0100, General Maintenance and WP 0087, Remove/Install Engine ECM Wiring Harness).

### WARNING

- High voltage is produced when this generator set is in operation. Do not contact output cables when operating this generator set. Failure to comply may cause injury or death to personnel.
- DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.
- High voltages may be present at the generator terminals when unit is rotating. Tools, equipment, clothing, and your body must be kept clear of rotating parts and electrical connections. Special precautions must be taken during troubleshooting because protective covers and safety devices may be removed or disabled to gain access and perform tests. Use extreme caution. Failure to comply may cause injury or death to personnel by electrocution.
- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

### NOTE

DCS code 2311, 271, or 272 may display during intermittent short check.

- STEP 11. If symptom continues, install connector at high-pressure fuel pump and check for an intermittent short by moving all connectors and wires with hands while engine is running.
- STEP 12. If movement of wiring affects fault code status (fault code becomes active or is able to be cleared after moving connectors or wires), replace ECM wiring harness (WP 0087, Remove/Install Engine ECM Wiring Harness).
- STEP 13. If symptom continues, replace high-pressure fuel pump (WP 0075, Remove/Install High-Pressure Fuel Pump).
- STEP 14. If symptom continues, replace ECM (WP 0081, Remove/Install Engine ECM).

### SYMPTOM

[Warning 2336: Checksum Fault] displayed on DCS screen.

### MALFUNCTION

Calibration file error.

**CORRECTIVE ACTION****NOTE**

[Warning 2336: Checksum Fault] only occurs while installing a calibration file. DCS code may display during process or at end of process.

STEP 1. Attempt to reinstall the calibration file IAW Recovering AMMPS DCS if Initial Calibration Fails task (WP 0100, General Maintenance).

STEP 2. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

**SYMPTOM**

[Warning 2545: Keyswitch Reset Required] displayed on DCS screen.

**MALFUNCTION**

Electrical or communication error.

**CORRECTIVE ACTION**

STEP 1. Move main DC circuit breaker to OFF/TRIP position and then move switch handle to RESET→ON position to interrupt and restore power to DCS (TM 9-6115-752-10).

STEP 2. If symptom continues, inspect ECM and ECM wiring harness at ECM for corroded pins, loose connections, or other damage. Replace or repair as required (WP 0100, General Maintenance; WP 0087, Remove/Install Engine ECM Wiring Harness; and WP 0081, Remove/Install Engine ECM).

STEP 3. If symptom continues, check DCS connector P3 for corroded pins, loose connections, or other damage. Replace or repair as required (WP 0017, Remove/Install DCS; WP 0039, Remove/Install Engine Wiring Harness; and WP 0100, General Maintenance).

**NOTE**

Keyswitch wire P3-Z runs from DCS J3 to ECM pin 39.

STEP 4. If symptom continues, use wiring diagrams and a multimeter set to test continuity to check ECM keyswitch wire for opens or shorts (WP 0039, Remove/Install Engine Wiring Harness; WP 0100, General Maintenance; and Foldout Pages).

STEP 5. Replace or repair engine wiring harness as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).

STEP 6. If symptom continues, test DCS LEDs (WP 0018, Repair DCS) and replace DCS (WP 0017, Remove/Install DCS) as required.

STEP 7. If symptom continues, replace ECM (WP 0081, Remove/Install Engine ECM).

**SYMPTOM**

[Warning 2727: J1939 Datalink Error] displayed on DCS screen.

**MALFUNCTION**

Electrical or communication error.

**CORRECTIVE ACTION**

Troubleshoot IAW [Fault 781: CAN Data Link Failure] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 2915: Genset Bus AC Meter Failed] displayed on DCS screen.

**MALFUNCTION**

Generator set Bus AC meter failed.

**CORRECTIVE ACTION****NOTE**

Failure of bus AC meter will disable paralleling functions for a generator set.

STEP 1. Press FAULT RESET to attempt to clear fault (TM 9-6115-752-10).

STEP 2. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

**SYMPTOM**

[Warning 2917: Genset Bus Voltage High] displayed on DCS screen.

**MALFUNCTION**

Paralleling or voltage sense fault.

**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

STEP 1. If operating in parallel, check connections between generators and ensure voltage and frequency of both generator sets are at the correct settings (TM 9-6115-752-10).

STEP 2. If symptom continues, troubleshoot IAW [Fault 2335: Excitation Fault] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 2936: Fuel Level Sensor High] displayed on DCS screen.

## NOTE

The fuel level sensor contains three wires that run to connector P70: P3-F (12 VDC supply), P3-G (signal wire, 0.25 VDC empty tank to 4.75 VDC full tank range), and P3-J (return). All wires run to DCS through P3 connector.

## MALFUNCTION

Fuel level sensor malfunction.

## CORRECTIVE ACTION

## WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

- STEP 1. Remove connector from fuel level sensor, turn engine control switch to PRIME & RUN (TM 9-6115-752-10), and use a multimeter set to test VDC (WP 0100, General Maintenance) to check P3-F and P3-j for voltage at P70 connector (Foldout Pages).
- STEP 2. If value is outside of 12 VDC range  $\pm 10\%$ , proceed to STEP 4.
- STEP 3. If value is within 12 VDC range  $\pm 10\%$ , proceed to STEP 7.
- STEP 4. Turn engine control switch to OFF (TM 9-6115-752-10), ensure battery ground cable is disconnected (WP 0037, Remove/Install Batteries), and use a multimeter set to continuity to test wiring (wires P3-F, P3-G, and P3-J) from fuel level sensor unit wiring harness connector to DCS for opens and shorts (WP 0100, General Maintenance and TM 9-6115-752-10).
- STEP 5. Repair or replace wiring as required and install connector (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).
- STEP 6. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).
- STEP 7. Turn engine control switch to OFF and test fuel level sensor (MT70) RED/WHT (A) and BLACK (B) wires using a multimeter set to test Ohms (WP 0100, General Maintenance and TM 9-6115-752-10).
- STEP 8. Replace fuel level sensor if Ohms reading stays at zero or shows infinite reading indicating an open. Install connector (WP 0051, Remove/Install Fuel Level Sensor).
- STEP 9. If symptom continues, ensure battery ground cable is disconnected (WP 0037, Remove/Install Batteries), remove connector, and test wire P3-J from P70 to DCS P3 for opens or shorts using a multimeter set to test continuity (WP 0100, General Maintenance).
- STEP 10. Repair or replace wiring harness as required and install connector (WP 0039, Remove/Install Engine Wiring Harness).
- STEP 11. If symptom continues and fuel level sensor has not been replaced, replace fuel level sensor (WP 0051, Remove/Install Fuel Level Sensor).
- STEP 12. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

## SYMPTOM

[Warning 2937: Fuel Level Sensor Low] displayed on DCS screen.

## MALFUNCTION

Fuel level sensor malfunction.

## CORRECTIVE ACTION

Troubleshoot IAW [Warning 2936: Fuel Level Sensor High] displayed on DCS screen symptom.

## SYMPTOM

[Warning 2968: AVR Fault] displayed on DCS screen.

## MALFUNCTION

Wiring or AC generator failure.

## CORRECTIVE ACTION

Troubleshoot IAW [Fault 2335: Excitation Fault] displayed on DCS screen symptom.

## SYMPTOM

[Warning 3662: Battery Discharge] displayed on DCS screen.

## MALFUNCTION

Loose belt, defective battery-charging alternator or tensioner, or defective electrical component.

## CORRECTIVE ACTION

## WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. Check for loose battery-charging alternator belt or malfunctioning belt tensioner and tighten belt or replace belt or belt tensioner as required (WP 0080, Remove/Install Battery-Charging Alternator Belt).
- STEP 2. If battery-charging alternator belt is not loose, test battery-charging alternator and replace as required (WP 0079, Remove/Install Battery-Charging Alternator).
- STEP 3. If symptom continues, check wiring connections to ensure that they are seated securely into connection ends at battery current sensor and DCS. Reseat wiring connections into connection ends as required (WP 0039, Remove/Install Engine Wiring Harness).
- STEP 4. If symptom continues, inspect wiring connections at battery current sensor and DCS for damage to pins or wires.
- STEP 5. If damage to pins or wires is found, repair or replace as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).

## WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

## NOTE

Wires P3-E, P3-r, and P3-J run from DCS to connector P5 at battery current sensor. P3-E supplies 5 VDC to battery current sensor, P3-r is the ground, and P3-J is the signal wire.

- STEP 6. If symptom continues, turn engine control switch to PRIME & RUN, remove connector, and use a multimeter set to test VDC to check connector P5 at battery current sensor for 4.75 to 5.25 VDC from P3-E to P3-r (WP 0100, General Maintenance and TM 9-6115-752-10).
- STEP 7. If voltage is within range, proceed to STEP 9.
- STEP 8. If voltage is not within range, proceed to STEP 12.
- STEP 9. Turn engine control switch to OFF, ensure battery ground cable is disconnected (WP 0037, Remove/Install Batteries), and use wiring diagrams (Foldout Pages) to check signal wire (P3-J) from battery current sensor to DCS for shorts or opens using a multimeter set to test continuity (WP 0100, General Maintenance).
- STEP 10. Repair or replace wiring as required and install connector (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).
- STEP 11. If symptom continues, replace battery current sensor as required.
- STEP 12. Turn engine control switch to OFF, ensure battery ground cable is disconnected (WP 0037, Remove/Install Batteries), and use wiring diagrams (Foldout Pages) to check wiring from battery current sensor to DCS for shorts or opens using a multimeter set to test continuity (WP 0100, General Maintenance).
- STEP 13. Repair or replace wiring as required and install connector (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).
- STEP 14. If symptom continues, check DCS LEDs and replace as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

## SYMPTOM

[Warning 3666: Master Control Switch Configuration] displayed on DCS screen.

## MALFUNCTION

Engine control switch fault.

## CORRECTIVE ACTION

- STEP 1. Rotate engine control switch and confirm that engine control switch is not between two positions.
- STEP 2. If symptom continues, confirm proper installation of engine control switch by checking for loose or damaged wires and repair or replace as required (WP 0018, Repair DCS).
- STEP 3. If symptom continues, test engine control switch and replace as required (WP 0018, Repair DCS).
- STEP 4. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

**SYMPTOM**

[Warning 3672: Automatic Field Flash Not Complete] displayed on DCS screen.

**MALFUNCTION**

Wiring or DCS malfunction.

**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

**NOTE**

DCS wires P1-J and P1-K run from DCS P1 to connector P90 to flash the AC alternator field.

- STEP 1. Use wiring diagrams (Foldout Pages) to locate and check wires running from AC generator to plug P90 to DCS J1 for damage, moisture, bent pins or connectors, or improper connection.
- STEP 2. Repair or replace as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).
- STEP 3. If symptom continues, ensure battery ground cable is disconnected (WP 0037, Remove/Install Batteries), remove connector (WP 0039, Remove/Install Engine Wiring Harness), and test wires P1-J and P1-K to pins J and K in DCS P1 (Foldout Pages) for shorts or opens using a multimeter set to test continuity (WP 0102, General Maintenance).
- STEP 4. Replace or repair as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).
- STEP 5. If symptom continues, test AC generator (WP 0057, Test AC Generator) and replace as required (WP 0055, Remove/Install 50/60 Hz AC Generator Assembly or WP 0056, Remove/Install 400 Hz AC Generator Assembly).
- STEP 6. If symptom continues, test DCS LEDs (WP 0018, Repair DCS) and replace DCS as required (WP 0017, Remove/Install DCS).

**SYMPTOM**

[Warning 3674: Genset Configuration Change] displayed on DCS screen.

**NOTE**

[Warning 3674: Genset Configuration Change] displays on DCS screen when the control cards of the DCS recognize the configuration has changed. This warning is most likely when a DCS is moved from one size generator set to a different size generator set. FAULT/RESET can be selected and normal use of the generator set can continue. If the symptom continues, then troubleshooting procedures will need to be followed.

**MALFUNCTION**

Incorrect dip switch settings, wiring malfunction, or improper engine or AC generator combination.

**CORRECTIVE ACTION**

Troubleshoot IAW [Fault 3664: Invalid Genset Configuration] displayed on DCS screen symptom.

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**ELECTRICAL SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Personnel Required**

91D (1)

Assistant (1)

**References**

TM 9-6115-752-10

WP 0008, Electrical System Troubleshooting with a DCS Code

WP 0016, Field PMCS

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

WP 0037, Remove/Install Batteries

WP 0038, Remove/Install Relay Panel

WP 0039, Remove/Install Engine Wiring Harness

**References**

WP 0040, Remove/Install Power Wiring Harness

WP 0041, Remove/Install Main DC Circuit Breaker

WP 0042, Remove/Install Intake Air Heater Relay

WP 0061, Remove/Install Convenience Receptacle

WP 0063, Remove/Install Printed Circuit Board Module

WP 0064, Remove/Install Hour Meter

WP 0079, Remove/Install Battery-Charging Alternator

WP 0082, Remove/Install Intake Air Heater

WP 0100, General Maintenance

Foldout Pages

**ELECTRICAL SYSTEM****WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are operating. Failure to comply may cause injury or death to personnel.

**WARNING**

- DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

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**NOTE**

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Read the entire corrective action sequence before beginning steps to complete corrective action for a malfunction.

**SYMPTOM**

DCS indicates no power available and no lighted display.

**MALFUNCTION**

Battery malfunction.

**CORRECTIVE ACTION****WARNING**

- Batteries give off combustible gas. Do not smoke or use open flame when performing maintenance. Failure to comply may cause injury or death to personnel and damage to equipment.
- Battery acid can cause burns to skin and cause eye injury. Wear safety goggles and chemical gloves and avoid acid splash while working on the batteries. Failure to comply may cause injury or death to personnel.
- Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.

STEP 1. If main DC circuit breaker is in OFF/TRIP position, move switch handle to RESET→ON position to reset circuit breaker.

STEP 2. If main DC circuit breaker remains in the RESET→ON position and DCS illuminates, resume operation.

STEP 3. If main DC circuit breaker continues to trip, proceed to next malfunction.

STEP 4. If DCS still has no lighted display, proceed to STEP 5.

STEP 5. Use DEAD CRANK SWITCH to see if batteries turn engine over (TM 9-6115-752-10).

STEP 6. If engine turns over, proceed to Defective DCS malfunction.

STEP 7. If engine does not turn over, continue to STEP 8.

STEP 8. Examine battery posts, cables, and connectors for looseness, corrosion, or other damage.

STEP 9. Clean and tighten corroded and loose connectors and replace any connecting cables that show signs of damage.

STEP 10. If symptom continues, completely disconnect the batteries from battery cables (WP 0037, Remove/Install Batteries).

STEP 11. Test batteries and jump start, charge, or replace as required (WP 0037, Remove/Install Batteries and WP 0100, General Maintenance).

STEP 12. If symptom continues, proceed to next malfunction.

### **MALFUNCTION**

Circuit breaker or wiring malfunction.

### **CORRECTIVE ACTION**

### **WARNING**

- High-voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure that personnel working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply may cause injury or death to personnel.
- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

STEP 1. Check circuit breakers in relay panel (RP201) to see if tripped (WP 0038, Remove/Install Relay Panel).

STEP 2. Reset circuit breaker(s) if tripped and check for signs of damage such as excessive heat or burned insulation (WP 0038, Remove/Install Relay Panel).

STEP 3. If heat or insulation damage is found, replace circuit breaker or relay and proceed to STEP 5 and follow troubleshooting to find failed component or location of short.

STEP 4. If no signs of excessive heat or burned insulation are found, but circuit breaker trips again, troubleshoot appropriate circuit using wiring diagrams and a multimeter set to test continuity (Foldout Pages; WP 0100, General Maintenance; and WP 0038, Remove/Install Relay Panel).

STEP 5. If symptom continues, test main DC circuit breaker. Replace as required (WP 0041, Remove/Install Main DC Circuit Breaker).

STEP 6. If main DC circuit breaker test shows main DC circuit breaker functioning properly, disconnect battery leads (WP 0037, Remove/Install Batteries) and proceed to STEP 7.

## WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

## NOTE

If continuity is found between ground and load wire, a short circuit exists within Relay Panel 201 (RP201), battery-charging alternator, the intake air heater relay (K18), or the air heater circuit to ground.

- STEP 7. Ensure battery ground cable is disconnected (WP 0037, Remove/Install Batteries) and use a multimeter selected to test continuity to check for shorts to ground in load wires from the main DC circuit breaker (Foldout Pages and WP 0100, General Maintenance).
- STEP 8. If short circuit is found, continue to STEP 10.
- STEP 9. If no short circuit is found, proceed to next malfunction.
- STEP 10. Disconnect load wires from load terminal of the main DC circuit breaker to separate for individual circuit analysis (WP 0038, Remove/Install Relay Panel and Foldout Pages).
- STEP 11. Test wires for shorts using a multimeter set to test continuity (WP 0100, General Maintenance).
- STEP 12. If short circuit is found, examine wiring and components within the isolated short circuit(s) visually to determine the wiring or component that is creating the short circuit.
- STEP 13. If visual examination reveals damaged wiring and/or components, repair and/or replace the damaged wiring (WP 0040, Remove/Install Power Wiring Harness) and/or components (WP 0042, Remove/Install Intake Air Heater Relay; WP 0038, Remove/Install Relay Panel; WP 0079, Remove/Install Battery-Charging Alternator; and WP 0082, Remove/Install Intake Air Heater).
- STEP 14. If visual examination does not reveal damage caused by a short circuit, disconnect each component at the terminal wires and check for shorts to ground of each component using a multimeter set to test continuity (Foldout Pages) (WP 0100, General Maintenance).
- STEP 15. Replace battery-charging alternator if continuity is found (WP 0079, Remove/Install Battery-Charging Alternator).
- STEP 16. If continuity is found in air intake heater circuit, test air intake heaters (WP 0082, Remove/Install Intake Air Heater) and repair or replace as required (WP 0082, Remove/Install Intake Air Heater).
- STEP 17. If continuity is found in RP201, determine whether the relay panel or a circuit or component powered from the relay panel is short circuited to ground using wiring diagrams and a multimeter set to test continuity (Foldout Pages and WP 0100, General Maintenance).
- STEP 18. Identify, isolate, and repair or replace plug connectors and/or components or wires that show evidence of a short circuit (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).
- STEP 19. If there are no visual damages or odor of burned insulation, open relay panel cover to examine internal components for signs of excessive heat and/or the odor of burned insulation.

STEP 20. If the wiring and/or components subjected to short circuit have been identified by a tripped circuit breaker (STEPS 1 through 4), remove the tripped circuit breaker and use wiring diagrams to find the cause of the short circuit (Foldout Pages).

STEP 21. Repair or replace wiring as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).

STEP 22. If symptom continues, test relays (WP 0038, Remove/Install Relay Panel).

STEP 23. Replace any relays and/or wiring that indicate short circuit until the cause of the short circuit has been eliminated (WP 0038, Remove/Install Relay Panel).

STEP 24. If symptom continues, proceed to next malfunction.

### **MALFUNCTION**

Defective DCS.

### **CORRECTIVE ACTION**

### **WARNING**

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

### **NOTE**

Wires P2-A, P2-B, and P2-C provide battery power to the DCS.

STEP 1. Check P1, P2, and P3 at DCS and ensure they are connected and tight. Connect or tighten as required (WP 0017, Remove/Install DCS).

STEP 2. If symptom continues, check connections at relay control panel and ensure they are tight and secure. Tighten or secure as required (WP 0038, Remove/Install Relay Panel).

STEP 3. If symptom continues, check CB7 in relay control panel to make sure it is secure and has not been tripped. Secure or reset as required (WP 0038, Remove/Install Relay Panel).

STEP 4. If breaker trips again or symptom continues, check wires P2-A, P2-B, and P2-C to DCS J2 and RP201 P5D for proper connections, opens, or shorts using wiring diagrams and a multimeter set to test continuity (WP 0100, General Maintenance and Foldout Pages).

STEP 5. Repair or replace wires and reset or replace CB7 as required (WP 0100, General Maintenance and WP 0038, Remove/Install Relay Panel).

STEP 6. If symptom continues or breaker was not tripped in STEP 3, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

### **SYMPTOM**

EMERGENCY STOP push button fails to stop generator set.

### **MALFUNCTION**

EMERGENCY STOP push button failure.

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**CORRECTIVE ACTION**

STEP 1. Push AC CIRCUIT INTERRUPT switch to place generator contactor in [CONTACTOR OPEN] position (TM 9-6115-752-10).

**WARNING**

- While inspecting the operation of the generator set, do not inadvertently reach into the generator set. Failure to comply can cause injury or death to personnel.
- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry and do not wear loose clothing when working on equipment. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator sets are operating. Failure to comply may cause injury or death to personnel.

STEP 2. Remove CB7 from relay panel (WP 0041, Remove/Install Relay Panel).

STEP 3. Place main DC circuit breaker in OFF/TRIP position (TM 9-6115-752-10).

STEP 4. Reinstall CB7 to relay panel (WP 0041, Remove/Install Relay Panel).

STEP 5. Test EMERGENCY STOP push button and repair or replace as required (WP 0018, Repair DCS).

**SYMPTOM**

No power to convenience receptacle or convenience receptacle fails to work.

**MALFUNCTION**

Convenience receptacle is defective or has been subjected to a ground fault condition.

**CORRECTIVE ACTION****WARNING**

Power is available to the convenience receptacle only when the main contactor is closed. Avoid accidental contact. Electrocution is possible. Failure to comply may cause injury or death to personnel.

STEP 1. Ensure [CONTACTOR] reads [CLOSED] on the DCS screen and generator set is generating power.

STEP 2. If contactor will not close, troubleshoot IAW Circuit interrupter will not close or open symptom.

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## NOTE

MEP 1060 and MEP 1061 contain a duplex receptacle as the convenience receptacle and a Ground Fault Interrupter (GFI) located inside the rear access door.

- STEP 3. If generator set is operating and the [CONTACTOR] reads [CLOSED], reset GFI and reset circuit breaker located above convenience receptacle as required (WP 0061, Remove/Install Convenience Receptacle and TM 9-6115-752-10). Proceed to next step.
- STEP 4. If circuit breaker located above convenience receptacle will not reset, replace circuit breaker (WP 0061, Remove/Install Convenience Receptacle).
- STEP 5. If GFI will not reset, replace GFI (WP 0061, Remove/Install Convenience Receptacle).

## WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 6. If symptom continues (GFI and/or circuit breaker will not reset), replace convenience receptacle (WP 0061, Remove/Install Convenience Receptacle).
- STEP 7. If symptom continues, shutdown generator set and remove battery ground cable (WP 0037, Remove/Install Batteries). Inspect wiring from relay, neutral, and ground output terminals to circuit breaker and GFI (Foldout Pages) for corrosion, frayed wires, or damaged insulation. Repair or replace wires as required (WP 0061, Remove/Install Convenience Receptacle and WP 0100, General Maintenance).
- STEP 8. If symptom continues, ensure battery ground cable is disconnected (WP 0037, Remove/Install Batteries), disconnect wires from relay as required (WP 0061, Remove/Install Convenience Receptacle), and use a multimeter set to test ohms ( $\Omega$ ) (WP 0100, General Maintenance) to check resistance between terminals 1 and 0 of relay coil.
- STEP 9. If resistance value is approximately 0  $\Omega$  (shorted) or approximately 100,000  $\Omega$  or greater (open), replace relay (WP 0061, Remove/Install Convenience Receptacle).
- STEP 10. If resistance value is greater than 0  $\Omega$  but less than 100,000  $\Omega$ , proceed to STEP 11.
- STEP 11. Use a multimeter set to test continuity (WP 0100, General Maintenance) to check continuity between terminals 8 and 7 and between terminals 4 and 3.
- STEP 12. If no continuity is found at either test point in STEP 11, replace relay (WP 0061, Remove/Install Convenience Receptacle).
- STEP 13. If continuity is found at both test points in STEP 11, use a multimeter set to test continuity (WP 0100, General Maintenance) to check for continuity at the following test points: terminal 3 and all other terminals except terminal 4; terminal 4 and all other terminals except terminal 3; terminal 8 and all other terminals except terminal 7; and terminal 7 and all other terminals except terminal 8.
- STEP 14. If continuity is found at any test point in STEP 13, replace relay (WP 0061, Remove/Install Convenience Receptacle).
- STEP 15. If no continuity is found at any test point in STEP 13, proceed to STEP 16.
- STEP 16. Ensure battery ground cable is disconnected (WP 0037, Remove/Install Batteries), disconnect wires as required, and test all wires for shorts or opens using a multimeter set to test continuity (Foldout Pages and WP 0100, General Maintenance).

STEP 17. Repair or replace wires as required (WP 0061, Remove/Install Convenience Receptacle and WP 0100, General Maintenance).

**SYMPTOM**

Circuit interrupter will not close or open.

**MALFUNCTION**

Contactor or wiring malfunction.

**CORRECTIVE ACTION**

Troubleshoot IAW [Fault 1452: Genset Contactor Fail To Close] (WP 0008, Electrical System Troubleshooting with a DCS Code).

**SYMPTOM**

Hour meter is no longer recording operating hours.

**MALFUNCTION**

Defective hour meter.

**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

**NOTE**

Wires P2-T and P2-a run from DCS J2 to connector P2 which runs to P500. From P500, the wires go into the printed circuit board module pins 37 and 46 of J500. Wires M3-A and M3-C run from the printed circuit board module to the hour meter.

- STEP 1. Check wiring from hour meter to printed circuit board module for loose connections, bent tabs or pins, or frayed wiring (Foldout Pages).
- STEP 2. Repair or replace wiring as required (WP 0100, General Maintenance and WP 0063, Remove/Install Printed Circuit Board Module).
- STEP 3. If symptom continues, check wiring from DCS to printed circuit board module for loose connections, bent tabs or pins, or frayed wiring (Foldout Pages).
- STEP 4. Repair or replace wiring as required (WP 0100, General Maintenance and WP 0039, Remove/Install Engine Wiring Harness).
- STEP 5. If symptom continues, ensure battery ground cable is disconnected (WP 0037, Remove/Install Batteries), disconnect wires as required, and check all wiring for shorts or opens using a multimeter set to test continuity (WP 0100, General Maintenance).



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- STEP 6. Repair or replace wiring as required (WP 0100, General Maintenance; WP 0063, Remove/Install Printed Circuit Board Module; and WP 0039, Remove/Install Engine Wiring Harness).
- STEP 7. If symptom continues, replace hour meter (WP 0064, Remove/Install Hour Meter).
- STEP 8. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**ENGINE SYSTEM TROUBLESHOOTING WITH A DCS CODE**

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**INITIAL SETUP:****Test Equipment**

Beaker, Laboratory (WP 0179, Table 2, Item 3)  
 Cable, Remote Control (WP 0179, Table 2, Item 6)  
 Test Set, Electronic Systems (WP 0179, Table 2, Item 25)

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Personnel Required**

91D (1)

**References**

TM 9-6115-752-10  
 WP 0006, Warning and Fault Codes  
 WP 0008, Electrical System Troubleshooting with a DCS Code  
 WP 0011, Engine System Troubleshooting without a DCS Code  
 WP 0012, Exhaust System Troubleshooting without a DCS Code  
 WP 0013, Winterization Kit Troubleshooting  
 WP 0016, Field PMCS  
 WP 0017, Remove/Install DCS  
 WP 0018, Repair DCS  
 WP 0019, Remove/Install Air Intake Hose Assemblies  
 WP 0020, Service Air Cleaner  
 WP 0021, Remove/Install Charge Air Cooler  
 WP 0024, Remove/Install Cooling Fans  
 WP 0037, Remove/Install Batteries  
 WP 0038, Remove/Install Relay Panel  
 WP 0039, Remove/Install Engine Wiring Harness

**References**

WP 0040, Remove/Install Power Wiring Harness  
 WP 0044, Service Fuel System  
 WP 0045, Remove/Install Fuel Pump, Main/Auxiliary  
 WP 0046, Remove/Install Fuel Manifold  
 WP 0047, Remove/Install Fuel Filter/Water Separator Assembly  
 WP 0048, Replace Fuel Filter/Water Separator Element  
 WP 0066, Remove/Install 50/60 Hz Engine Assembly  
 WP 0067, Remove/Install 400 Hz Engine Assembly  
 WP 0068, Service Lubrication System  
 WP 0069, Remove/Install Oil Drain Hose Assembly  
 WP 0071, Remove/Install Oil Cooler  
 WP 0072, Remove/Install Spin-On Fuel Filter Assembly  
 WP 0073, Remove/Install Fuel Rail  
 WP 0074, Test/Replace Fuel Injector  
 WP 0075, Remove/Install High Pressure Fuel Pump  
 WP 0078, Remove/Install Starter  
 WP 0079, Remove/Install Battery-Charging Alternator  
 WP 0080, Remove/Install Battery-Charging Alternator Belt  
 WP 0081, Remove/Install Engine ECM  
 WP 0082, Remove/Install Intake Air Heater  
 WP 0083, Remove/Install Intake Manifold  
 WP 0084, Remove/Install Muffler  
 WP 0085, Remove/Install Turbocharger  
 WP 0086, Remove/Install Exhaust Manifold  
 WP 0087, Remove/Install Engine ECM Wiring Harness

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**INITIAL SETUP — CONTINUED:****References**

WP 0088, Remove/Install Engine ECM Sensors  
WP 0090, Check/Adjust Valves  
WP 0091, Remove/Install Flywheel  
WP 0092, Remove/Install Oil Pan and Strainer  
WP 0093, Test Engine Oil Pressure  
WP 0100, General Maintenance  
WP 0101, Remove/Install Harmonic Balancer  
Foldout Pages

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**ENGINE SYSTEM TROUBLESHOOTING WITH A DCS CODE****NOTE**

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Read the entire corrective action sequence before beginning steps to complete corrective action for a malfunction.

FAULT RESET switch must be pushed to clear each fault code as it is addressed.

Capture spilled fluids and dispose of IAW local SOP.

**SYMPTOM**

[Fault 155: High Intake Manifold Temperature] displayed on DCS screen.

**MALFUNCTION**

Charge air cooler or turbocharger problem.

**CORRECTIVE ACTION****WARNING**

Cooling fan has sharp blades. Use caution and wear gloves when removing or installing fan. Failure to comply may cause injury or death to personnel.

**NOTE**

[Fault 155: High Intake Manifold Temperature] displays on DCS screen when intake manifold temperature reaches 210°F (99°C) for 30 sec or more. [Warning 488: High Intake Manifold 1 Temp] displays on DCS screen when intake manifold temperature reaches 200°F (93°C) for 30 sec or more.

STEP 1. Inspect cooling fans for blockage, damage, or malfunction.

STEP 2. Repair or replace cooling fan(s) if blockage or damage is found (WP 0024, Remove/Install Cooling Fans), or troubleshoot IAW Inoperable cooling fan(s) malfunction ([Fault 151: High Coolant Temperature] displayed on DCS screen, WP 0007, Cooling System Troubleshooting with a DCS Code) if cooling fan(s) is found to be malfunctioning.

STEP 3. If symptom continues, inspect charge air cooler for debris, restricted air flow, damage to intake air hoses, or other signs of damage or improper operation. Replace or repair as required (WP 0021, Remove/Install Charge Air Cooler).

## WARNING

- When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow exhaust system to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

- A turbocharger may become very hot and requires more time to cool down than other parts of engine assembly. Shut down generator set and allow it to cool sufficiently before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

STEP 4. If symptom continues, inspect turbocharger for signs of compressor fan damage (WP 0085, Remove/Install Turbocharger). Replace as required (WP 0085, Remove/Install Turbocharger).

STEP 5. If symptom continues, check exhaust system components for signs of blockage or damage that would cause improper back pressure (WP 0084, Remove/Install Muffler and WP 0086, Remove/Install Exhaust Manifold).

STEP 6. If symptom continues, inspect intake manifold for damage and replace as required (WP 0083, Remove/Install Intake Manifold).

STEP 7. If symptom continues, troubleshoot sensor IAW [Warning 122: Intake Manifold Pressure Sensor High] symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).

## SYMPTOM

[Fault 234: Overspeed Shutdown] displayed on DCS screen.

## NOTE

[Warning 1992: High Speed Warning] displays on DCS when engine speed is 9% greater than rated speed. [Fault 234: Overspeed Shutdown] occurs when engine speed is 10% greater than rated speed.

## MALFUNCTION

Large block load removal or vapor drawn into intake air passage.

## CORRECTIVE ACTION

STEP 1. Shut down and restart generator set (TM 9-6115-752-10).

STEP 2. If symptom continues, troubleshoot IAW [Fault 115: Speed Signal Lost] (WP 0008, Electrical System Troubleshooting with a DCS Code).

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## WARNING

- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

STEP 3. If symptom continues, check for source of flammable vapor being drawn into the intake air passage.

STEP 4. Remedy by removing source of flammable vapor or relocate generator set.

STEP 5. If symptom continues, check turbocharger seals for leaking oil (WP 0085, Remove/Install Turbocharger).

STEP 6. Replace turbocharger as required (WP 0085, Remove/Install Turbocharger).

STEP 7. If symptom continues, replace ECM (WP 0081, Remove/Install Engine ECM).

## SYMPTOM

[Fault 359: Fail to Start] displayed on DCS screen.

## NOTE

[Fault 359: Fail to Start] displays once a failure to start results after a continuous crank engage time of 75 seconds.

## MALFUNCTION

Fuel tank is empty or improper connection.

### CORRECTIVE ACTION

STEP 1. Check to see if there is fuel in the tank visually and check DCS screen for fuel status (TM 9-6115-752-10).

STEP 2. If tank is empty, fill fuel tank (TM 9-6115-752-10).

STEP 3. If symptom continues, inspect wiring harness at main and auxiliary fuel pumps and ensure two connectors are installed to correct fuel pumps (WP 0045, Remove/Install Fuel Pump Main/Auxiliary, WP 0039, Remove/Install Engine Wiring Harness, and Foldout Pages).

STEP 4. If symptom continues, proceed to next malfunction.

## MALFUNCTION

Dirty air cleaner element, intake air hose restriction, or excess backpressure.

### CORRECTIVE ACTION

STEP 1. Check air cleaner element and replace as required (WP 0020, Service Air Cleaner).

- STEP 2. Inspect intake hose for restriction or signs of damage and replace as required (WP 0019, Remove/Install Air Intake Hose Assemblies).
- STEP 3. If symptom continues, check for excess backpressure IAW High pitched hiss or whistle heard at exhaust outlet with a decrease in engine performance symptom (WP 0012, Exhaust System Troubleshooting without a DCS Code).
- STEP 4. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Fuel system malfunction.

**CORRECTIVE ACTION**

- STEP 1. Check fuel filter/water separator for water and drain fuel filter/water separator as required (TM 9-6115-752-10).
- STEP 2. If symptom continues, check fuel flow and purge fuel lines (WP 0044, Service Fuel System).
- STEP 3. If symptom continues, inspect fuel manifold by fuel filter/water separator for incorrect connections and clogs and repair or replace as required (WP 0047, Remove/Install Fuel Filter/Water Separator Assembly).
- STEP 4. If symptom continues, service fuel strainers if not already serviced (WP 0044, Service Fuel System) and inspect fuel manifold for leaks or damage (WP 0046, Remove/Install Fuel Manifold).
- STEP 5. If symptom continues, change spin-on fuel filter element (WP 0072, Remove/Install Spin-On Fuel Filter Assembly).
- STEP 6. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Improper clearance (open or close timing) of intake/exhaust valves.

**CORRECTIVE ACTION**

- STEP 1. Adjust valve clearance (WP 0090, Check/Adjust Valves).
- STEP 2. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Cold weather conditions.

**CORRECTIVE ACTION****NOTE**

Intake air heaters will turn on between 20°F and -25°F (-6°C and -32°C) and winterization kit will turn on below -25°F (-32°C).

- STEP 1. Allow time for winterization kit/starting aids to work if outside normal temperature range (TM 9-6115-752-10).
- STEP 2. If malfunction is suspected, troubleshoot IAW Cold weather starting aids fail to work properly (WP 0011, Engine System Troubleshooting without a DCS Code).

STEP 3. If symptom continues, proceed to next malfunction.

## **MALFUNCTION**

Fuel injection malfunction.

### **CORRECTIVE ACTION**

STEP 1. Check fuel injection lines for loose nuts or leakage and repair or replace as required (WP 0074, Test/Replace Fuel Injectors).

STEP 2. If symptom continues, test fuel injectors (WP 0074, Test/Replace Fuel Injectors).

STEP 3. Replace as required (WP 0074, Test/Replace Fuel Injectors).

STEP 4. If symptom continues, proceed to next malfunction.

## **MALFUNCTION**

Internal engine problem.

### **CORRECTIVE ACTION**

Replace engine (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).

## **SYMPTOM**

[Fault 415: Low Oil Pressure] displayed on DCS screen.

### **NOTE**

[Warning 143: Pre-Low Oil Pressure] will display on DCS when oil pressure reaches 13 psi at rated load or idle. [Fault 415: Low Oil Pressure] will display on the DCS and cause a generator set shutdown when oil pressure reaches 8 psi at rated load or idle.

## **MALFUNCTION**

Low engine oil level.

### **CORRECTIVE ACTION**

### **WARNING**

Allow engine to cool from normal operating temperature prior to draining engine oil and removing oil filter. Failure to comply may cause injury or death to personnel.

### **NOTE**

Capture drained engine oil and dispose of IAW local SOP.

STEP 1. Check engine oil level and appearance. If oil appears diluted or contaminated, proceed to Internal engine problem malfunction or add engine oil if low (TM 9-6115-752-10).

STEP 2. If engine oil was added in STEP 1, proceed to STEP 4.

STEP 3. If engine oil was not low, proceed to next malfunction.



## WARNING

- When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow exhaust system to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- A turbocharger may become very hot and requires more time to cool down than other parts of engine assembly. Shut down generator set and allow it to cool sufficiently before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
  - STEP 4. Check oil lines for leaks or damage at turbocharger, engine oil drain valve and hose, oil cooler, and oil filter. Repair or replace as required (WP 0069, Remove/Install Oil Drain Hose Assembly, WP 0085, Remove/Install Turbocharger, WP 0068, Service Lubrication System, and WP 0071, Remove/Install Oil Cooler).
  - STEP 5. If symptom continues, inspect area around flywheel and AC generator for signs of oil leaks. Replace crankshaft oil seal if leaks are found (WP 0091, Remove/Install Flywheel).
  - STEP 6. If symptom continues and no leaks are found, troubleshoot IAW Excessive Oil Consumption symptom (WP 0011, Engine System Troubleshooting without a DCS Code).

## MALFUNCTION

Defective engine oil pressure sender.

### CORRECTIVE ACTION

- STEP 1. Perform oil pressure test to determine engine oil pressure on DCS screen is accurate (WP 0093, Test Engine Oil Pressure).
- STEP 2. If oil pressure reading on DCS is not accurate, troubleshoot IAW [Warning 135: Oil Pressure Sensor High] symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).
- STEP 3. If symptom continues or pressure reading is accurate, proceed to next malfunction.

## MALFUNCTION

Internal engine problem.

### CORRECTIVE ACTION

- STEP 1. Examine oil on dipstick for evidence of coolant or fuel (TM 9-6115-752-10).
- STEP 2. If no coolant or fuel is found, proceed to next malfunction.
- STEP 3. If coolant or fuel is found, change oil if not already changed as a result of troubleshooting (WP 0068, Service Lubrication System).
- STEP 4. If symptom continues (coolant or fuel continues to show on dipstick), replace engine assembly (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).

**MALFUNCTION**

Clogged oil strainer.

**CORRECTIVE ACTION**

- STEP 1. Inspect and replace oil strainer as required (WP 0092, Remove/Install Oil Pan and Strainer).
- STEP 2. If strainer is not clogged or symptom continues, replace engine assembly (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).

**SYMPTOM**

[Fault 449: High Fuel Supply Pressure] displayed on DCS screen.

**NOTE**

If [Warning 271: Fuel Pressure Solenoid Valve Low], [Warning 272: Fuel Pressure Solenoid Valve High], and/or [Warning 2311: Fuel Injection Control Valve Failure] appears on DCS screen with [Fault 449: High Fuel Supply Pressure], troubleshoot IAW the warning codes first to find possible malfunction.

**MALFUNCTION**

Fuel or fuel pump pressure malfunction.

**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

**NOTE**

Check for air bubbles in catch container while performing fuel flow test. A few bubbles will normally exit the line during the test, but if air continues to bubble through hose for several minutes, an air leak is present.

- STEP 1. Check fuel flow IAW WP 0044, Service Fuel System and check for air bubbles.
- STEP 2. Replace defective component as required (WP 0044, Service Fuel System).
- STEP 3. If symptom continues, proceed to STEP 6 of [Warning 559: Low Injector Metering 1 Pressure] displayed on DCS screen symptom and troubleshoot to the end of steps.
- STEP 4. If symptom continues, troubleshoot IAW [Warning 451: Injector Metering Rail 1 Pressure: High Voltage] symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).

**SYMPTOM**

[Fault 1245: Engine Shutdown] displayed on DCS screen.

**NOTE**

When the ECM sends fault information to the DCS it comes in two pieces. The first piece defines it as a fault or a warning and the second provides the number of the fault or warning. If [Fault 1245: Engine Shutdown] occurs the second piece of data was not received by the DCS from the ECM.

**MALFUNCTION**

Unidentified engine ECM shutdown.

**CORRECTIVE ACTION**

STEP 1. Clear fault and attempt to continue normal operation (TM 9-6115-752-10).

STEP 2. If symptom continues, check all wiring and connections between ECM and DCS IAW [Fault 781: CAN Data Link Failure] displayed on DCS screen (WP 0008, Electrical System Troubleshooting with a DCS Code).

**SYMPTOM**

[Fault 1438: Fail to Crank] displayed on DCS screen.

**NOTE**

[Fault 1438: Fail to Crank] displays when the engine fails to rotate or the DCS fails to sense the engine rotation. When engine control switch turns over the engine, but [Fault 1438: Fail to Crank] appears and prevents starting, the malfunction is speed signal related ([Fault 115: Speed Signal Lost] (WP 0008, Electrical System Troubleshooting with a DCS Code)).

**MALFUNCTION**

DEAD CRANK SWITCH is not in NORMAL position or will not turn over engine.

**CORRECTIVE ACTION**

STEP 1. Ensure the DEAD CRANK SWITCH is in NORMAL position (TM 9-6115-752-10).

STEP 2. If not in NORMAL position, place DEAD CRANK SWITCH in NORMAL position (TM 9-6115-752-10).

STEP 3. If symptom continues, use DEAD CRANK SWITCH to turn over engine (TM 9-6115-752-10).

STEP 4. If engine turns over, proceed to Defective wiring or DCS malfunction.

STEP 5. If engine does not turn over, proceed to next malfunction.

**MALFUNCTION**

Battery connections are loose or batteries are insufficiently charged.

## **CORRECTIVE ACTION**

### **WARNING**

Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.

- STEP 1. Check for corroded or loose battery connections. Clean/replace corroded battery connections and tighten loose connections as required (WP 0037, Remove/Install Batteries).
- STEP 2. Check DCS voltage meter for a reading less than 24 VDC indicating battery voltage is low (TM 9-6115-752-10).
- STEP 3. If battery voltage is not low, proceed to next malfunction.
- STEP 4. If battery voltage is low, use a multimeter selected for the appropriate VDC scale to measure the voltage of each battery at the battery terminals (WP 0100, General Maintenance and WP 0037, Remove/Install Batteries).
- STEP 5. Charge batteries, start engine utilizing the NATO slave receptacle and an outside power source, or replace batteries as required (WP 0037, Remove/Install Batteries, WP 0100, General Maintenance, and (TM 9-6115-752-10).
- STEP 6. Start generator set and observe DCS [Battery] [Adc] indicator to ensure battery-charging alternator is charging batteries properly (TM 9-6115-752-10). Test battery-charging alternator if batteries are not charging properly and replace as required (WP 0079, Remove/Install Battery-Charging Alternator).
- STEP 7. If symptom continues, proceed to next malfunction.

## **MALFUNCTION**

Defective starter or flywheel.

### **CORRECTIVE ACTION**

- STEP 1. Test starter and replace as required (WP 0078, Remove/Install Starter).
- STEP 2. If symptom continues, check flywheel for damage or obstruction and repair or replace as required (WP 0091, Remove/Install Flywheel).
- STEP 3. If symptom continues, proceed to next malfunction.

## **MALFUNCTION**

Defective wiring or DCS.

### **CORRECTIVE ACTION**

- STEP 1. Test relay K10 and replace as required (WP 0038, Remove/Install Relay Panel).

## WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

## NOTE

When performing starter test in STEP 2, use engine control switch in the START position instead of using DEAD CRANK SWITCH. Test will determine if DCS is supplying voltage to the starter.

- STEP 2. If symptom continues, test starter IAW WP 0078, Remove/Install Starter using START position of engine control switch.
- STEP 3. If proper voltage is detected at starter, replace starter as required if not already replaced (WP 0078, Remove/Install Starter).
- STEP 4. If low or no voltage is detected at starter, remove battery ground cable (WP 0037, Remove/Install Batteries) and test starter wiring leads for shorts or opens using wiring diagrams (Foldout Pages) and a multimeter set to test continuity (WP 0100, General Maintenance).
- STEP 5. Repair or replace wiring as required (WP 0100, General Maintenance) (WP 0040, Remove/Install Power Wiring Harness).
- STEP 6. If symptom continues, ensure battery ground cable is removed (WP 0037, Remove/Install Batteries) and use wiring diagrams (Foldout Pages) and a multimeter set to test continuity (WP 0100, General Maintenance) to check wires P3-Y and P2-L for opens or shorts.
- STEP 7. Replace or repair wiring as required (WP 0039, Remove/Install Engine Wiring Harness).
- STEP 8. If symptom continues, test engine control switch and replace as required (WP 0018, Repair DCS).
- STEP 9. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

## SYMPTOM

[Warning 124: High Intake Manifold Pressure] displayed on DCS screen.

## MALFUNCTION

Charge air cooler or turbocharger problem.

## CORRECTIVE ACTION

Troubleshoot IAW [Fault 155: High Intake Manifold Temperature] displayed on DCS screen symptom.

## SYMPTOM

[Warning 143: Pre-Low Oil Pressure] displayed on DCS screen.

**NOTE**

[Warning 143: Pre-Low Oil Pressure] will display on DCS when oil pressure reaches 13 psi at rated load or idle. [Fault 415: Low Oil Pressure] will display on the DCS and cause a generator set shutdown when oil pressure reaches 8 psi at rated load or idle.

**MALFUNCTION**

Engine oil malfunction.

**CORRECTIVE ACTION**

Troubleshoot IAW [Fault 415: Low Oil Pressure] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 281: Cylinder Pressure Imbalance] displayed on DCS screen.

**NOTE**

[Warning 281: Cylinder Pressure Imbalance] displays when a pumping imbalance is detected between the two high-pressure plungers inside the high-pressure fuel pump. A faulty fuel rail pressure sensor signal due to a damaged fuel rail pressure sensor signal wire will cause the fuel rail pressure sensor to be inconsistent. This condition can cause [Warning 281: Cylinder Pressure Imbalance] to become active on an intermittent basis.

**MALFUNCTION**

High-pressure fuel malfunction.

**CORRECTIVE ACTION**

Troubleshoot IAW [Fault 449: High Fuel Supply Pressure] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 418: High Water In Fuel] displayed on DCS screen.

**MALFUNCTION**

Water in fuel.

**CORRECTIVE ACTION**

STEP 1. Check for water in fuel and drain water from bowl of fuel filter/water separator as required (TM 9-6115-752-10).

STEP 2. If symptom continues, ensure fuel quality is acceptable and use fresh fuel as required.

## WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 3. If symptom continues with no water found in fuel, check wiring connections to ensure that they are seated securely into connection ends at water-in-fuel sensor and ECM. Reseat wiring connections into connection ends as necessary (WP 0087, Remove/Install Engine ECM Wiring Harness and WP 0047, Remove/Install Fuel Filter/Water Separator Assembly).
- STEP 4. If symptom continues, remove battery ground cable (WP 0037, Remove/Install Batteries), remove connector at water in fuel sensor, and use wiring diagrams and a multimeter set to test Ohms to check resistance of water-in-fuel sensor between signal pin sleeve (1) and return pin sleeve (2) at water-in-fuel sensor (WP 0100, General Maintenance and Foldout Pages).
- STEP 5. If infinite or high resistance (approximately 100,000 Ohms or greater) reading is obtained, proceed to STEP 7.
- STEP 6. If resistance reading less than 100,000 Ohms is obtained, proceed to STEP 9.
- STEP 7. Replace fuel filter/water separator bowl (with water-in-fuel sensor) (WP 0047, Remove/Install Fuel Filter/Water Separator Assembly) and check for corrosion, damage, or buildup on the probe tips of faulty water-in-fuel sensor.
- STEP 8. If corrosion, damage, or buildup is found on probe tips of faulty water-in-fuel sensor, replace fuel filters (WP 0048, Replace Fuel Filter/Water Separator Element and WP 0072, Remove/Install Spin-On Fuel Filter Assembly) and continue to monitor quality of fuel used. Resume operation.
- STEP 9. Inspect wiring connections at water-in-fuel sensor and ECM for damage to pins or wires.
- STEP 10. If damage to pins or wires is found, replace or repair as required (WP 0087, Remove/Install Engine ECM Wiring Harness and WP 0100, General Maintenance).

## NOTE

ECM wiring harness signal wire for the water-in-fuel sensor runs from sensor plug pin 1 to ECM pin 34. ECM wiring harness return wire for the water-in-fuel sensor runs from sensor plug pin 2 to the coolant temperature sensor return wire to ECM pin 47.

- STEP 11. If symptom continues, use wiring diagrams and a multimeter set to test continuity to check ECM wiring harness running to water-in-fuel sensor and ECM for shorts or opens (WP 0087, Remove/Install Engine ECM Wiring Harness, WP 0100, General Maintenance, and Foldout Pages).
- STEP 12. Repair or replace as required (WP 0087, Remove/Install Engine ECM Wiring Harness and WP 0100, General Maintenance).
- STEP 13. If symptom continues, replace ECM (WP 0081, Remove/Install Engine ECM).

## SYMPTOM

[Warning 488: High Intake Manifold 1 Temp] displayed on DCS screen.

**MALFUNCTION**

Charge air cooler or turbocharger problem.

**CORRECTIVE ACTION**

Troubleshoot IAW [Fault 155: High Intake Manifold Temperature] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 559: Low Injector Metering 1 Pressure] displayed on DCS screen.

**MALFUNCTION**

Fuel pressure or fuel system malfunction.

**CORRECTIVE ACTION****NOTE**

[Warning 559: Low Injector Metering 1 Pressure] displays on DCS when fuel pressure is sensed to be at least 1450 psi (10 MPa) below commanded value. DCS codes 281, 449, or 2311 may display on DCS screen (or have high inactive counts) with DCS code 559; troubleshoot IAW DCS troubleshooting for the applicable codes. DCS code 1117 may display on DCS screen (or have high inactive counts) if there is a power supply malfunction. (See [Warning 1117: Power Lost With Ignition On] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code)).

- STEP 1. Check fuel tank for proper level and fill as required (WP 0044, Service Fuel System).
- STEP 2. If symptom continues, troubleshoot for fuel leaks IAW Evidence of fluid leakage found around engine symptom (WP 0011, Engine System Troubleshooting without a DCS Code).
- STEP 3. If symptom continues, troubleshoot IAW [Warning 451: Injector Metering Rail 1 Pressure: High Voltage] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).

**NOTE**

Check for air bubbles in catch container while performing fuel flow test. A few bubbles will normally exit the line during the test, but if air continues to bubble through hose for several minutes, an air leak is present.

- STEP 4. If symptom continues, check fuel flow IAW WP 0044, Service Fuel System and check for air bubbles.
- STEP 5. Replace defective component as required (WP 0044, Service Fuel System).
- STEP 6. If fuel flow problem is isolated to lift fuel pump or components before lift fuel pump in fuel system (e.g., fuel strainers) and no leaks can be found, proceed to STEP 18.
- STEP 7. If no fuel flow problem is found using checks in WP 0044, Service Fuel System, proceed to next step.
- STEP 8. Disconnect low pressure supply line from high-pressure fuel pump (WP 0075, Remove/Install High-Pressure Fuel Pump).



## WARNING

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

- STEP 9. Insert low pressure supply line into a graduated beaker.
- STEP 10. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10) but do not start generator set.
- STEP 11. Measure fuel flow for a 36 sec interval.
- STEP 12. Turn engine control switch to OFF (TM 9-6115-752-10) and connect low pressure supply line to high-pressure fuel pump (WP 0075, Remove/Install High-Pressure Fuel Pump).
- STEP 13. If fuel flow is not greater than 10 oz (300 mL) in 36 sec, proceed to STEP 15.
- STEP 14. If fuel flow is greater than 10 oz (300 mL) in 36 sec, proceed to STEP 27.
- STEP 15. Replace spin-on fuel filter element (WP 0072, Remove/Install Spin-On Fuel Filter Assembly).
- STEP 16. If symptom continues, inspect fuel supply line and fittings from fuel pump (WP 0075, Remove/Install High-Pressure Fuel Pump) to spin-on fuel filter assembly (WP 0072, Remove/Install Spin-On Fuel Filter Assembly) for damage, kinks, or other signs of restriction.
- STEP 17. Replace fuel supply lines and/or fittings as required (WP 0075, Remove/Install High-Pressure Fuel Pump and WP 0072, Remove/Install Spin-On Fuel Filter Assembly). If symptom continues, proceed to STEP 27.
- STEP 18. Service fuel strainers if not already serviced (WP 0044, Service Fuel System).

## WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

- STEP 19. If symptom continues, turn engine control switch to PRIME & RUN (TM 9-6115-752-10), remove electrical connector P65, and use wiring diagrams and a multimeter set to test VDC to check for proper voltage to fuel pump (WP 0100, General Maintenance and Foldout Pages).
- STEP 20. Turn engine control switch to OFF (TM 9-6115-752-10).
- STEP 21. If voltage is within 24 VDC  $\pm 10\%$  range, proceed to STEP 26.
- STEP 22. If voltage is not 24 VDC  $\pm 10\%$  range, use wiring diagrams and a multimeter set to test continuity to check wiring for shorts or opens (WP 0100, General Maintenance and Foldout Pages).
- STEP 23. Replace or repair wiring as required (WP 0039, Remove/Install Engine Wiring Harness).
- STEP 24. If symptom continues, test relays K10 and K11 for proper operation and replace as required (WP 0038, Remove/Install Relay Panel).
- STEP 25. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS). Resume operation.

STEP 26. Replace fuel pump (WP 0045, Remove/Install Fuel Pump, Main/Auxiliary). Resume operation.

STEP 27. Test pressure relief valve for proper operation (WP 0073, Remove/Install Fuel Rail).

### NOTE

If DCS codes 272, 449, or 2311 are active, do not replace the fuel rail pressure relief valve without first troubleshooting the other active DCS codes (WP 0006, Warning and Fault Codes).

STEP 28. Replace fuel rail as required (WP 0073, Remove/Install Fuel Rail).

STEP 29. If symptom continues, check fuel injector drain flow (WP 0074, Test/Replace Fuel Injector).

STEP 30. Replace fuel injector(s) as required (WP 0074, Test/Replace Fuel Injector).

STEP 31. Test high pressure fuel pump drain line restriction (WP 0075, Remove/Install High Pressure Fuel Pump).

STEP 32. Replace high-pressure fuel pump as required (WP 0075, Remove/Install High Pressure Fuel Pump).

### SYMPTOM

[Warning 731: Crankshaft Mechanical Misalignment] displayed on DCS screen.

### MALFUNCTION

Crankshaft and camshaft engine speed sensor misaligned.

### CORRECTIVE ACTION

STEP 1. Inspect engine speed sensors for visible damage or defects (WP 0088, Remove/Install Engine ECM Sensors).

STEP 2. Replace as required (WP 0088, Remove/Install Engine ECM Sensors).

STEP 3. If symptom continues, visually inspect for damage to harmonic balancer (See WP 0080, Remove/Install Battery-Charging Alternator Belt for location).

STEP 4. If visible damage is found, replace harmonic balancer (WP 0101, Remove/Install Harmonic Balancer).

### WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

STEP 5. If no damage is found, use wiring diagrams and a multimeter to check for shorts to ground and proper grounding between engine block, starter, alternator, and generator set (WP 0100, General Maintenance and Foldout Pages).

STEP 6. If symptom continues, replace engine (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly) and mark original engine to be inspected for improper alignment of camshaft or crankshaft gear.

**SYMPTOM**

[Warning 1246: Unknown Engine Fault] displayed on DCS screen.

**MALFUNCTION**

Unidentified engine ECM shutdown.

**CORRECTIVE ACTION**

Troubleshoot IAW [Fault 1245: Engine Shutdown] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 1852: Pre-High Water In Fuel] displayed on DCS screen.

**MALFUNCTION**

Water in fuel.

**CORRECTIVE ACTION**

Troubleshoot IAW [Warning 418: High Water In Fuel] displayed on DCS screen symptom.

**SYMPTOM**

[Warning 1992: High Speed Warning] displayed on DCS screen.

**MALFUNCTION**

Engine speed malfunction.

**CORRECTIVE ACTION**

Troubleshoot IAW [Fault 234: Overspeed Shutdown] displayed on DCS screen symptom.

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**ENGINE SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Personnel Required**

91D (1)

**References**

TM 9-6115-752-10

WP 0006, Warning and Fault Codes

WP 0007, Cooling System Troubleshooting with a DCS Code

WP 0008, Electrical System Troubleshooting with a DCS Code

WP 0010, Engine System Troubleshooting with a DCS Code

WP 0012, Exhaust System Troubleshooting without a DCS Code

WP 0013, Winterization Kit Troubleshooting

WP 0016, Field PMCS

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

WP 0019, Remove/Install Air Intake Hose Assemblies

WP 0020, Service Air Cleaner

WP 0022, Service Cooling System

WP 0025, Remove/Install Radiator Hose and Tube Assemblies

WP 0026, Remove/Install Winterization Kit Components

WP 0028, Remove/Install Radiator Assembly

WP 0037, Remove/Install Batteries

**References**

WP 0040, Remove/Install Power Wiring Harness

WP 0042, Remove/Install Intake Air Heater Relay

WP 0044, Service Fuel System

WP 0045, Remove/Install Fuel Pump, Main/Auxiliary

WP 0046, Remove/Install Fuel Manifold

WP 0047, Remove/Install Fuel Filter/Water Separator Assembly

WP 0048, Replace Fuel Filter/Water Separator Element

WP 0049, Remove/Install Fuel Lines

WP 0050, Remove/Install Fuel Cooler

WP 0052, Remove/Install Fuel Tank

WP 0053, Remove/Install Fuel Tank Drain Valve Assembly

WP 0054, Remove/Install Fuel Tank Filler Neck

WP 0066, Remove/Install 50/60 Hz Engine Assembly

WP 0067, Remove/Install 400 Hz Engine Assembly

WP 0068, Service Lubrication System

WP 0069, Remove/Install Oil Drain Hose Assembly

WP 0070, Remove/Install Coalescer

WP 0071, Remove/Install Oil Cooler

WP 0072, Remove/Install Spin-On Fuel Filter Assembly

WP 0074, Test/Replace Fuel Injectors

WP 0075, Remove/Install High-Pressure Fuel Pump

WP 0076, Remove/Install Water Pump

WP 0077, Remove/Install Thermostat

WP 0078, Remove/Install Starter

WP 0079, Remove/Install Battery-Charging Alternator

WP 0082, Remove/Install Intake Air Heater

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**INITIAL SETUP — CONTINUED:****References**

WP 0085, Remove/Install Turbocharger  
WP 0089, Remove/Install Valve Cover  
WP 0090, Check/Adjust Valves  
WP 0091, Remove/Install Flywheel  
WP 0092, Remove/Install Oil Pan and Strainer  
WP 0100, General Maintenance  
WP 0102, Remove/Install Gear Case Cover

**References**

WP 0103, Replace Cylinder Head Gasket  
Foldout Pages

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**ENGINE ASSEMBLY****WARNING**

- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Allow engine to cool from normal operating temperature prior to draining engine oil and removing oil filter. Failure to comply may cause injury or death to personnel.
- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator set is running. Failure to comply may cause injury or death to personnel.
- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

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**WARNING**

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

**NOTE**

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Read the entire corrective action sequence before beginning steps to complete corrective action for a malfunction.

Capture spilled fluids and dispose of IAW local SOP.

**SYMPTOM**

Evidence of fluid leakage found around engine.

**NOTE**

Capture spilled fluids and dispose of IAW local SOP.

**MALFUNCTION**

Engine is leaking oil.

**CORRECTIVE ACTION****WARNING**

Allow engine to cool from normal operating temperature prior to draining engine oil and removing oil filter. Failure to comply may cause injury or death to personnel.

- STEP 1. Check for oil leaks at oil cooler and oil filter. Replace or repair as required (WP 0068, Service Lubrication System and WP 0071, Remove/Install Oil Cooler).
- STEP 2. If loose, tighten oil filter as required (WP 0068, Service Lubrication System).
- STEP 3. If symptom continues, inspect valve cover and valve cover gasket (WP 0089, Remove/Install Valve Cover). Replace as required.
- STEP 4. If symptom continues, inspect coalescer and crankcase breather lines. Replace as required (WP 0070, Remove/Install Coalescer and WP 0089, Remove/Install Valve Cover).
- STEP 5. If symptom continues, inspect oil inlet line and oil outlet line to and from turbocharger (WP 0085, Remove/Install Turbocharger) and engine oil drain valve and hose (WP 0069, Remove/Install Oil Drain Hose Assembly).
- STEP 6. Replace any line if found to be leaking or damaged (WP 0085, Remove/Install Turbocharger and WP 0069, Remove/Install Oil Drain Hose Assembly).

- STEP 7. If symptom continues, inspect area around flywheel and AC generator for signs of oil leaks (WP 0091, Remove/Install Flywheel).
- STEP 8. Replace rear crankshaft seal if signs of leakage or damage are found (WP 0091, Remove/Install Flywheel).
- STEP 9. If symptom continues, inspect area around gear case cover and harmonic balancer for signs of oil leaks (WP 0102, Remove/Install Gear Case Cover).
- STEP 10. Replace front oil seal if signs of leakage or damage are found (WP 0102, Remove/Install Gear Case Cover).
- STEP 11. If symptom continues, inspect oil pan. Replace oil pan as required (WP 0092, Remove/Install Oil Pan and Strainer).
- STEP 12. If symptom continues with a Class III leak, replace engine assembly (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).

## **MALFUNCTION**

Engine is leaking coolant.

## **CORRECTIVE ACTION**

## **WARNING**

- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.
- Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.

## **CAUTION**

Be sure to close radiator cap securely to avoid coolant leakage. Engine may overheat if cap is loose. Failure to comply may cause damage to equipment.

- STEP 1. Inspect radiator hoses and coolant recovery bottle and hoses for leaks. Repair or replace as required (WP 0025, Remove/Install Radiator Hose and Tube Assemblies).
- STEP 2. If symptom continues, inspect radiator and test cap. Replace as required (WP 0028, Remove/Install Radiator Assembly and WP 0022, Service Cooling System).
- STEP 3. If symptom continues, inspect water pump and thermostat for leaks. Replace as required (WP 0076, Remove/Install Water Pump and WP 0077, Remove/Install Thermostat).
- STEP 4. If symptom continues, inspect oil cooler and hoses and replace as required (WP 0071, Remove/Install Oil Cooler).
- STEP 5. If symptom continues, inspect winterization kit, if applicable, and replace or repair as required (WP 0026, Remove/Install Winterization Kit Components).
- STEP 6. If symptom continues, inspect cylinder head gasket and freeze plugs on engine for signs of a Class III leak. Replace cylinder head gasket and/or freeze plugs as required (WP 0103, Replace Cylinder Head Gasket and WP 0100, General Maintenance).



- STEP 7. If symptom continues, examine oil on dipstick for evidence of coolant or other foreign fluid.
- STEP 8. If evidence of coolant or other foreign fluid is found on dipstick, check engine compression and replace engine as required (WP 0103, Replace Cylinder Head Gasket and WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).

**MALFUNCTION**

Engine is leaking fuel.

**CORRECTIVE ACTION****WARNING**

Do not operate generator set if any fuel leaks are present. Fuel is combustible. Always perform PMCS before operation. Failure to comply may cause injury or death to personnel.

- STEP 1. Inspect all fuel hoses. Replace as required (WP 0049, Remove/Install Fuel Lines).
- STEP 2. Inspect fuel filter/water separator assembly. Replace as required (WP 0047, Remove/Install Fuel Filter/Water Separator Assembly).
- STEP 3. Inspect fuel injectors and lines. Replace as required (WP 0074, Test/Replace Fuel Injectors).
- STEP 4. Inspect fuel tank and fuel filler neck for leaks. Replace as required (WP 0052, Remove/Install Fuel Tank and WP 0054, Remove/Install Fuel Tank Filler Neck).
- STEP 5. Tighten fuel drain line valve if necessary and inspect fuel drain line for leaks. Replace as required (WP 0053, Remove/Install Fuel Tank Drain Valve Assembly).
- STEP 6. Inspect fuel pumps and fuel manifold for leaks. Replace as required (WP 0045 Remove/Install Fuel Pump, Main/Auxiliary and WP 0046, Remove/Install Fuel Manifold).
- STEP 7. Inspect fuel cooler for leaks. Replace as required (WP 0050, Remove/Install Fuel Cooler).

**SYMPTOM**

Engine cranks slowly and fails to start.

**MALFUNCTION**

Battery connections are loose or batteries are insufficiently charged.

**CORRECTIVE ACTION****WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.
  - STEP 1. Check for corroded or loose battery connections. Clean/replace corroded battery connections and tighten loose battery connections as required (WP 0037, Remove/Install Batteries).
  - STEP 2. Check DCS voltage meter for a reading less than 24 VDC indicating battery voltage is low (TM 9-6115-752-10).
  - STEP 3. If battery voltage is not low, proceed to next malfunction.
  - STEP 4. If battery voltage is low, use a multimeter selected for the appropriate VDC scale to measure the voltage of each battery at the battery terminals (WP 0100, General Maintenance and WP 0037, Remove/Install Batteries).
  - STEP 5. Charge batteries, start engine utilizing the NATO slave receptacle and an outside power source, or replace batteries as required (WP 0037, Remove/Install Batteries and WP 0100, General Maintenance).
  - STEP 6. Start generator set and observe DCS [Battery] [Adc] indicator to ensure battery-charging alternator is charging batteries properly (TM 9-6115-752-10). Test battery-charging alternator if batteries are not charging properly and replace as required (WP 0079, Remove/Install Battery-Charging Alternator).

**MALFUNCTION**

Dirty air cleaner element or intake air restriction.

**CORRECTIVE ACTION**

- STEP 1. Check air cleaner element and replace as required (WP 0020, Service Air Cleaner).
- STEP 2. If symptom continues, inspect intake hose for restriction or signs of damage and replace as required (WP 0019, Remove/Install Air Intake Hose Assemblies).
- STEP 3. If symptom continues, check exhaust system for excess back pressure IAW High pitched hiss or whistle heard at exhaust outlet with a decrease in engine performance symptom (WP 0012, Exhaust System Troubleshooting without a DCS Code).
- STEP 4. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Fuel system malfunction.

**CORRECTIVE ACTION**

- STEP 1. Check fuel filter/water separator for water and drain fuel filter/water separator as required (TM 9-6115-752-10).
- STEP 2. If symptom continues, check fuel flow and purge fuel lines (WP 0044, Service Fuel System).
- STEP 3. If symptom continues, inspect fuel manifold by fuel filter/water separator for correct connections and clogs (WP 0047, Remove/Install Fuel Filter/Water Separator Assembly).
- STEP 4. If symptom continues, service fuel strainers if not already serviced (WP 0044, Service Fuel System) and inspect fuel manifold for leaks or damage. Repair or replace as required (WP 0046, Remove/Install Fuel Manifold).
- STEP 5. If symptom continues, replace spin-on fuel filter element (WP 0072, Remove/Install Spin-On Fuel Filter Assembly).
- STEP 6. If symptom continues, check fuel cooler for damage or clogs, and replace as required (WP 0050, Remove/Install Fuel Cooler).
- STEP 7. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Cold weather conditions.

**CORRECTIVE ACTION****NOTE**

Air intake heater will turn on between 20°F and -25°F (-6°C and -32°C) and winterization kit will turn on at -25°F (-32°C) and below.

- STEP 1. Allow time for winterization kit/starting aids to work if outside normal temperature range (TM 9-6115-752-10).
- STEP 2. If malfunction is suspected, proceed to Cold weather starting aids fail to work properly symptom.
- STEP 3. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Starter is defective/wiring is incorrect.

**CORRECTIVE ACTION**

- STEP 1. Test starter, and replace as required (WP 0078, Remove/Install Starter).

**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 2. If symptom continues, ensure wiring is correctly installed to starter and adjust as required (WP 0078, Remove/Install Starter).

- STEP 3. If symptom continues, test starter wiring leads for shorts or opens using wiring diagrams (WP 0102, Wiring Diagrams) and a multimeter set to test continuity (WP 0100, General Maintenance).
- STEP 4. Repair or replace wiring as required (WP 0100, General Maintenance and WP 0040, Remove/Install Power Wiring Harness).
- STEP 5. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Flywheel is defective.

**CORRECTIVE ACTION****WARNING**

When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

- STEP 1. Inspect starter/flywheel connection and look for damaged or missing flywheel teeth.
- STEP 2. If flywheel is defective (missing teeth) replace flywheel (WP 0091, Remove/Install Flywheel).
- STEP 3. If symptom continues or flywheel is not defective, proceed to next malfunction.

**MALFUNCTION**

Fuel injection malfunction.

**CORRECTIVE ACTION**

- STEP 1. Check fuel injection lines for loose nuts or leakage and replace or repair as required (WP 0074, Test/Replace Fuel Injectors).
- STEP 2. If symptom continues, test fuel injectors and replace fuel injectors as required (WP 0074, Test/Replace Fuel Injectors).
- STEP 3. If symptom continues, test high-pressure fuel pump and replace as required (WP 0075, Remove/Install High-Pressure Fuel Pump).
- STEP 4. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Internal engine problem.

**CORRECTIVE ACTION**

Replace engine (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).

**SYMPTOM**

Engine will not shut down.

**MALFUNCTION**

Engine control switch fault.

**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. Use EMERGENCY STOP push button to shut down generator set (TM 9-6115-752-10).
- STEP 2. Rotate engine control switch and confirm that engine control switch is not between two positions.
- STEP 3. Confirm proper installation of engine control switch (WP 0018, Repair DCS).
- STEP 4. Check for loose or damaged wires (WP 0018, Repair DCS).
- STEP 5. Test engine control switch and replace as required (WP 0018, Repair DCS).
- STEP 6. If symptom continues, test DCS and replace DCS (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

**SYMPTOM**

Engine cranks normally but fails to start.

**MALFUNCTION**

Engine system malfunction.

**CORRECTIVE ACTION**

Troubleshoot IAW [Fault 359: Fail to Start] displayed on DCS screen symptom (WP 0010, Engine System Troubleshooting with a DCS Code).

**SYMPTOM**

Engine starts but stops after starting.

**MALFUNCTION**

No or low fuel.

**CORRECTIVE ACTION**

STEP 1. Check fuel tank. Fill as required (WP 0044, Service Fuel System).

STEP 2. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Fuel system malfunction.

**CORRECTIVE ACTION**

STEP 1. Check fuel filter/water separator for water and drain fuel filter/water separator as required (TM 9-6115-752-10).

STEP 2. If symptom continues, check fuel flow and purge fuel lines (WP 0044, Service Fuel System).

STEP 3. If symptom continues, inspect fuel manifold by fuel filter/water separator for incorrect connections and clogs. Repair or replace as required (WP 0047, Remove/Install Fuel Filter/Water Separator Assembly).

STEP 4. If symptom continues, service fuel strainers if not already serviced (WP 0044, Service Fuel System) and inspect fuel manifold for leaks or damage. Repair or replace as required (WP 0046, Remove/Install Fuel Manifold).

STEP 5. If symptom continues, replace spin-on fuel filter element (WP 0072, Remove/Install Spin-On Fuel Filter Assembly).

STEP 6. If symptom continues, check fuel cooler for damage or clogs and replace as required (WP 0050, Remove/Install Fuel Cooler).

STEP 7. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Dirty air cleaner element or intake air restriction.

**CORRECTIVE ACTION**

STEP 1. Check air cleaner element and replace as required (WP 0020, Service Air Cleaner).

STEP 2. Inspect intake hose for restriction or signs of damage and replace as required (WP 0019, Remove/Install Air Intake Hose Assemblies).

STEP 3. If symptom continues, check exhaust system for excess back pressure IAW High pitched hiss or whistle heard at exhaust outlet with a decrease in engine performance symptom (WP 0012, Exhaust System Troubleshooting without a DCS Code).

STEP 4. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Engine control switch fault.

**CORRECTIVE ACTION****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

- STEP 1. Rotate engine control switch and confirm that engine control switch is not between two positions.
- STEP 2. Confirm proper installation of engine control switch (WP 0018, Repair DCS).
- STEP 3. Check for loose or damaged wires (WP 0018, Repair DCS).
- STEP 4. If symptom continues, test engine control switch and replace as required (WP 0018, Repair DCS).
- STEP 5. If symptom continues, replace DCS (WP 0017, Remove/Install DCS).

**MALFUNCTION**

Fuel injection or DCS malfunction.

**CORRECTIVE ACTION**

- STEP 1. Check fuel injection lines for loose nuts or leakage and replace or repair as required (WP 0074, Test/Replace Fuel Injectors).
- STEP 2. If symptom continues, test fuel injectors and replace as required (WP 0074, Test/Replace Fuel Injectors).
- STEP 3. If symptom continues, test high-pressure fuel pump and replace as required (WP 0075, Remove/Install High-Pressure Fuel Pump).
- STEP 4. If symptom continues, test DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

**SYMPTOM**

Engine stops suddenly during normal operation.

**MALFUNCTION**

Engine malfunction.

**CORRECTIVE ACTION**

Troubleshoot IAW Engine starts but stops after starting symptom.

**SYMPTOM**

Engine runs erratically, performs poorly (does not develop full power), or misfires.

**MALFUNCTION**

Dirty air cleaner element.

**CORRECTIVE ACTION**

- STEP 1. Check air filter restriction indicator and inspect air cleaner element (TM 9-6115-752-10). Replace air cleaner element as required (TM 9-6115-752-10).
- STEP 2. If symptom continues, check exhaust system for excess back pressure IAW High pitched hiss or whistle heard at exhaust outlet with a decrease in engine performance symptom (WP 0012, Exhaust System Troubleshooting without a DCS Code).
- STEP 3. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Insufficient oil level.

**CORRECTIVE ACTION**

- STEP 1. Check oil level and fill as required (WP 0068, Service Lubrication System).
- STEP 2. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Fuel system malfunction.

**CORRECTIVE ACTION**

- STEP 1. Check fuel filter/water separator for water and drain fuel filter/water separator as required (TM 9-6115-752-10).
- STEP 2. If symptom continues, check fuel flow and purge fuel lines (WP 0044, Service Fuel System).
- STEP 3. If symptom continues, inspect fuel manifold by fuel filter/water separator for incorrect connections and clogs. Repair or replace as required (WP 0047, Remove/Install Fuel Filter/Water Separator Assembly).
- STEP 4. If symptom continues, service fuel strainers if not already serviced (WP 0044, Service Fuel System) and inspect fuel manifold for leaks or damage. Repair or replace as required (WP 0046, Remove/Install Fuel Manifold).
- STEP 5. If symptom continues, replace spin-on fuel filter element (WP 0072, Remove/Install Spin-On Fuel Filter Assembly).
- STEP 6. If symptom continues, check fuel cooler for damage or clogs and replace as required (WP 0050, Remove/Install Fuel Cooler).
- STEP 7. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Turbocharger waste gate valve malfunction.

**CORRECTIVE ACTION**

- STEP 1. Inspect turbocharger (WP 0085, Remove/Install Turbocharger).
- STEP 2. Replace turbocharger as required (WP 0085, Remove/Install Turbocharger).
- STEP 3. If symptom continues, proceed to next malfunction.



**MALFUNCTION**

Valves improperly adjusted.

**CORRECTIVE ACTION**

STEP 1. Adjust valves (WP 0090, Check/Adjust Valves).

STEP 2. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Fuel injection malfunction.

**CORRECTIVE ACTION**

STEP 1. Check fuel injection lines for loose nuts or leakage and replace or repair as required (WP 0074, Test/Replace Fuel Injectors).

STEP 2. If symptom continues, test fuel injectors and replace as required (WP 0074, Test/Replace Fuel Injectors).

STEP 3. If symptom continues, test high-pressure fuel pump and replace as required (WP 0075, Remove/Install High-Pressure Fuel Pump).

STEP 4. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Internal engine problem.

**CORRECTIVE ACTION**

Replace engine (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).

**SYMPTOM**

Engine stability or hunting problems.

**MALFUNCTION**

High or low ambient temperatures.

**CORRECTIVE ACTION**

Adjust gain settings (WP 0017, Remove/Install DCS).

**SYMPTOM**

Excessive oil consumption.

**MALFUNCTION**

Oil change overdue, incorrect grade or type (for ambient temperature range), or oil level too high.

**CORRECTIVE ACTION**

STEP 1. Perform a lubrication system change (WP 0068, Service Lubrication System).

STEP 2. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Leakage from oil lines, oil filter, or valve cover.

**CORRECTIVE ACTION**

STEP 1. Check for oil leaks at oil cooler and oil filter. Replace or repair as required (WP 0068, Service Lubrication System and WP 0071, Remove/Install Oil Cooler).

STEP 2. If loose, tighten oil filter as required (WP 0068, Service Lubrication System).

STEP 3. Inspect valve cover and valve cover gasket (WP 0089, Remove/Install Valve Cover). Replace as required.

STEP 4. Inspect coalescer and crankcase breather lines. Replace as required (WP 0070, Remove/Install Coalescer and WP 0089, Remove/Install Valve Cover).

STEP 5. Inspect oil inlet line and oil outlet line to and from turbocharger (WP 0085, Remove/Install Turbocharger) and engine oil drain valve and hose (WP 0069, Remove/Install Oil Drain Hose Assembly).

STEP 6. Replace any line if found to be leaking or damaged (WP 0085, Remove/Install Turbocharger and WP 0069, Remove/Install Oil Drain Hose Assembly).

STEP 7. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Diluted engine oil.

**CORRECTIVE ACTION**

STEP 1. Examine oil on dipstick for evidence of coolant or other foreign fluid (TM 9-6115-752-10).

STEP 2. Change oil, if not already changed as a result of troubleshooting (WP 0068, Service Lubrication System).

STEP 3. If oil remains contaminated with coolant or foreign fluid, check engine compression (WP 0103, Replace Cylinder Head Gasket).

STEP 4. If compression test reveals fault, replace cylinder head gasket (WP 0103, Replace Cylinder Head Gasket).

STEP 5. If compression test does not reveal fault and coolant or foreign fluid is no longer on dipstick, proceed to next malfunction.

STEP 6. If coolant or foreign fluid continues to show on dipstick after cylinder head gasket has been replaced, replace engine assembly (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).

**MALFUNCTION**

Leaking rear oil seal.

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**CORRECTIVE ACTION****WARNING**

When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

STEP 1. Inspect area around flywheel and AC generator for signs of oil leaks.

STEP 2. Replace rear oil seal if signs of oil leaks are found (WP 0091, Remove/Install Flywheel).

STEP 3. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Crankcase breather line clogged.

**CORRECTIVE ACTION****WARNING**

Eye protection is required when working with compressed air. Do not use compressed air to clean skin. Do not aim at personnel. Compressed air can propel particles at high velocity and injure eyes. Failure to comply may cause injury or death to personnel.

STEP 1. Remove and clean crankcase breather line with compressed air.

STEP 2. Replace as required (WP 0089, Remove/Install Valve Cover).

STEP 3. If symptom continues, proceed to Engine runs erratically, performs poorly (does not develop full power), or misfires symptom.

STEP 4. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Improper seal of oil pan or clogged oil strainer.

**CORRECTIVE ACTION**

STEP 1. Replace oil pan or repair seal (WP 0092, Remove/Install Oil Pan and Strainer).

STEP 2. Inspect and replace oil strainer as required (WP 0092, Remove/Install Oil Pan and Strainer).

STEP 3. If strainer is not clogged or symptom continues, proceed to next malfunction.

**MALFUNCTION**

Fuel injection malfunction.

**CORRECTIVE ACTION**

STEP 1. Test fuel injectors and replace as required (WP 0074, Test/Replace Fuel Injectors and WP 0075, Remove/Install Fuel Injector).

STEP 2. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Internal engine problem.

**CORRECTIVE ACTION**

Replace engine assembly (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).

**SYMPTOM**

Engine knocks or makes excessive noise.

**MALFUNCTION**

Oil level low.

**CORRECTIVE ACTION**

STEP 1. Check engine oil level and refill as required (WP 0068, Service Lubrication System).

STEP 2. Troubleshoot IAW Excessive oil consumption symptom.

STEP 3. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Internal engine problem.

**CORRECTIVE ACTION**

Replace engine (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).

**SYMPTOM**

Abnormal or high-pitched ascending and descending sounds heard from engine compartment.

**MALFUNCTION**

Turbocharger damage.

**CORRECTIVE ACTION****WARNING**

A turbocharger runs at very high speeds, becomes very hot, and requires more time to cool down than other parts of the engine assembly. Allow generator set to cool for at least 30 min before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

STEP 1. Inspect turbocharger for visible damage (WP 0085, Remove/Install Turbocharger).

STEP 2. Replace turbocharger if found to be damaged (WP 0085, Remove/Install Turbocharger).

STEP 3. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Exhaust system malfunction.

**CORRECTIVE ACTION**

STEP 1. Troubleshoot for high-pitched hiss or whistle heard at exhaust outlet with decrease in engine performance (WP 0012, Exhaust System Troubleshooting without a DCS Code).

STEP 2. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Engine problem.

**CORRECTIVE ACTION**

Troubleshoot IAW Engine knocks or makes excessive noise symptom.

**SYMPTOM**

White smoke seen emitting from engine compartment.

**MALFUNCTION**

Coolant leak.

**CORRECTIVE ACTION****WARNING**

Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Failure to comply may cause injury or death to personnel.

STEP 1. Inspect hoses for leaks. Replace as required (WP 0025, Remove/Install Radiator Hoses and Tube Assemblies).

STEP 2. If symptom continues, pressure test cooling system for evidence of leaks (WP 0022, Service Cooling System).

STEP 3. Proceed to STEP 5 if evidence of leaks is found.

STEP 4. Proceed to next malfunction if no evidence of leaks is found.

STEP 5. Inspect radiator and test cap. Replace as required (WP 0028, Remove/Install Radiator Assembly and WP 0022, Service Cooling System).

STEP 6. Inspect water pump and/or thermostat. Replace as required (WP 0076, Remove/Install Water Pump and WP 0077, Remove/Install Thermostat).

STEP 7. Inspect oil cooler and hoses and replace as required (WP 0071, Remove/Install Oil Cooler).

STEP 8. Inspect winterization kit, if applicable and replace as required (WP 0026, Remove/Install Winterization Kit Components).

STEP 9. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Fuel injection malfunction.

**CORRECTIVE ACTION**

- STEP 1. Check fuel injection lines for loose nuts or leakage, and replace or repair as required (WP 0074, Test/Replace Fuel Injectors).
- STEP 2. If symptom continues, test fuel injectors and replace as required (WP 0074, Test/Replace Fuel Injectors).
- STEP 3. If symptom continues, test high-pressure fuel pump and replace as required (WP 0075, Remove/Install High-Pressure Fuel Pump).
- STEP 4. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Turbocharger lube oil line or outlet oil line leak.

**CORRECTIVE ACTION**

- STEP 1. Inspect lube oil line and outline for leaks and replace as required (WP 0085, Remove/Install Turbocharger).
- STEP 2. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Internal engine problem.

**CORRECTIVE ACTION**

Replace engine (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).

**SYMPTOM**

Blue or black smoke from engine compartment with strong odors.

**MALFUNCTION**

Wires burning.

**CORRECTIVE ACTION**

- STEP 1. Shut down generator set.

**WARNING**

Wear heat resistant gloves and avoid contacting hot metal surfaces with hands and exposed skin after components have been heated. Wear additional protective clothing as required. Failure to comply may cause injury or death to personnel.

- STEP 2. Inspect engine compartment for fire/wires burning.
- STEP 3. Extinguish any flames IAW SOP.

STEP 4. If fire is not visible, inspect wires for damage due to excessive heat or odor of burned insulation.

STEP 5. If evidence of wire burning is found, locate cause of problem before replacing any components or attempting restart.

**SYMPTOM**

Oil mixed with coolant.

**MALFUNCTION**

Leaking cylinder head assembly gasket or internal engine problem.

**CORRECTIVE ACTION**

STEP 1. Replace cylinder head gasket (WP 0103, Replace Cylinder Head Gasket).

STEP 2. If coolant or foreign fluid continues to show on dipstick after cylinder head gasket has been replaced, replace engine assembly (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).

**SYMPTOM**

Oil mixed with fuel.

**MALFUNCTION**

Internal engine problem.

**CORRECTIVE ACTION**

STEP 1. Drain all fuel from system (WP 0044, Service Fuel System).

STEP 2. Purge fuel system (WP 0044, Service Fuel System).

STEP 3. Replace engine (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).

**SYMPTOM**

Cold weather starting aids fail to work properly.

**MALFUNCTION**

Cold weather starting aid malfunction.

**CORRECTIVE ACTION****NOTE**

Intake air heater will turn on between 20°F and -25°F (-6°C and -32°C) and winterization kit will turn on at -25°F (-32°C) and below.

STEP 1. If using a generator set with a winterization kit and a malfunction is suspected, troubleshoot IAW WP 0013, Winterization Kit Troubleshooting.

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- STEP 2. If not using a winterization kit or if another malfunction is suspected, test batteries and ensure battery voltage is at proper level (WP 0037, Remove/Install Batteries).
- STEP 3. If symptom continues, check for loose connections, moisture, loose pins or wires, or other damage at connections at intake air heater relay and intake air heater (WP 0082, Remove/Install Intake Air Heater and WP 0042, Remove/Install Intake Air Heater Relay). Repair or replace as required (WP 0100, General Maintenance).
- STEP 4. If symptom continues, test intake air heater relay for proper function. Replace as required (WP 0042, Remove/Install Intake Air Heater Relay).
- STEP 5. If symptom continues, test intake air heater for proper function. Replace as required (WP 0082, Remove/Install Intake Air Heater).
- STEP 6. If symptom continues, use a multimeter set to test ohms and wiring diagrams to check wire K18-2 to intake air heater for shorts or opens (WP 0100, General Maintenance and Foldout Pages). Repair or replace wiring as required (WP 0100, General Maintenance).
- STEP 7. If symptom continues, use a multimeter set to test ohms and wiring diagrams to check wires P2-E and P2-b at intake air heater for opens or shorts (WP 0100, General Maintenance and Foldout Pages). Repair or replace wiring as required (WP 0100, General Maintenance).
- STEP 8. If symptom continues, check DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**EXHAUST SYSTEM TROUBLESHOOTING WITHOUT A DCS CODE**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Personnel Required**

91D (1)

**References**

TM 9-6115-752-10

WP 0009, Electrical System Troubleshooting without a DCS Code

WP 0016, Field PMCS

WP 0019, Remove/Install Air Intake Hose Assemblies

WP 0020, Service Air Cleaner

WP 0026, Remove/Install Winterization Kit Components

WP 0044, Service Fuel System

WP 0048, Replace Fuel Filter/Water Separator Element

WP 0066, Remove/Install 50/60 Hz Engine Assembly

**References**

WP 0067, Remove/Install 400 Hz Engine Assembly

WP 0068, Service Lubrication System

WP 0074, Test/Replace Fuel Injectors

WP 0075, Remove/Install High-Pressure Fuel Pump

WP 0077, Remove/Install Thermostat

WP 0080, Remove/Install Battery-Charging Alternator Belt

WP 0082, Remove/Install Intake Air Heater

WP 0083, Remove/Install Intake Manifold

WP 0084, Remove/Install Muffler

WP 0085, Remove/Install Turbocharger

WP 0086, Remove/Install Exhaust Manifold

WP 0090, Check/Adjust Valves

WP 0103, Replace Cylinder Head Gasket

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**EXHAUST SYSTEM****WARNING**

- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- Hot exhaust gases can ignite combustible materials. Allow room for safe discharge of hot gases. Failure to comply may cause injury or death to personnel.

**WARNING**

- When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Wear heat resistant gloves and avoid contacting hot metal surfaces with hands and exposed skin after components have been heated. Wear additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- A turbocharger may become very hot and requires more time to cool down than other parts of engine assembly. Shut down generator set and allow it to cool sufficiently before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

**NOTE**

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Read the entire corrective action sequence before beginning steps to complete corrective action for a malfunction.

**SYMPTOM**

High pitched hiss or whistle heard at exhaust outlet with a decrease in engine performance.

**MALFUNCTION**

High back pressure or restriction in exhaust system.

**CORRECTIVE ACTION****WARNING**

- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- Hot exhaust gases can ignite combustible materials. Allow room for safe discharge of hot gases. Failure to comply may cause injury or death to personnel.
- When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- A turbocharger may become very hot and requires more time to cool down than other parts of engine assembly. Shut down generator set and allow it to cool sufficiently before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

STEP 1. Check exhaust outlet on top of generator set to be sure it is clear of obstructions.

- STEP 2. Check that protection cap is operating properly. Repair or replace as required (WP 0084, Remove/Install Muffler).
- STEP 3. Check pipes throughout exhaust system for dents or kinks that could be causing restriction in the exhaust system. Replace or repair as required (WP 0084, Remove/Install Muffler).
- STEP 4. Remove flex pipe and inspect muffler for visual damage, restriction, or excess carbon buildup. Remove restrictions, install or replace flex pipe as required, or replace muffler as required (WP 0084, Remove/Install Muffler).
- STEP 5. Inspect exhaust manifold for signs of damage or restriction. Remove restrictions or replace as required (WP 0086, Remove/Install Exhaust Manifold).
- STEP 6. Inspect turbocharger for damage or improper function and replace as required (WP 0085, Remove/Install Turbocharger).
- STEP 7. If symptom continues, proceed to next malfunction.

## **SYMPTOM**

Abnormal sound heard from exhaust system with a decrease in engine performance.

## **MALFUNCTION**

Exhaust system leak.

## **CORRECTIVE ACTION**

## **WARNING**

- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- Hot exhaust gases can ignite combustible materials. Allow room for safe discharge of hot gases. Failure to comply may cause injury or death to personnel.
- When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- A turbocharger may become very hot and requires more time to cool down than other parts of engine assembly. Shut down generator set and allow it to cool sufficiently before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

- STEP 1. Check cylinder head to exhaust manifold connection, exhaust manifold to turbocharger connection, turbocharger to flex pipe connection, flex pipe to muffler connection, and muffler to rain cap connection for signs of damage or leaks (WP 0085, Remove/Install Turbocharger; WP 0086, Remove/Install Exhaust Manifold; or WP 0084, Remove/Install Muffler). Look for signs of heat escape such as discoloration or heat damage to surrounding components and discolored or burned paint around gasket and cylinder head exhaust outlet ports.

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- STEP 2. Replace any connection or gasket that shows signs of damage or leaking (WP 0085, Remove/Install Turbocharger; WP 0086, Remove/Install Exhaust Manifold; or WP 0084, Remove/Install Muffler).
  - STEP 3. If symptom continues, check muffler for damage or exhaust leaks. Replace as required (WP 0084, Remove/Install Muffler).
  - STEP 4. If symptom continues, inspect exhaust manifold for cracks or signs of damage. Replace as required (WP 0086, Remove/Install Exhaust Manifold).
  - STEP 5. If symptom continues, wrap wiping rags around exhaust pipes at areas susceptible to wear or corrosion and use pliers to gently squeeze for weak spots or damage. Replace exhaust pipes as required (WP 0084, Remove/Install Muffler).
  - STEP 6. Check for air leak from discharge side of turbocharger. Replace as required (WP 0085, Remove/Install Turbocharger).
  - STEP 7. If operating generator set in cold weather conditions, inspect system for signs of water corrosion. If evidence of condensation is found, inspect and test winterization kit and intake air heaters and replace as required (WP 0026, Remove/Install Winterization Kit Components and WP 0082, Remove/Install Air Intake Heater).
  - STEP 8. If symptom continues, proceed to next malfunction.

#### **MALFUNCTION**

Internal engine problem.

#### **CORRECTIVE ACTION**

Replace engine assembly (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).

#### **SYMPTOM**

Intermittent hissing or popping noise is heard when engine is running.

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## WARNING

- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- Hot exhaust gases can ignite combustible materials. Allow room for safe discharge of hot gases. Failure to comply may cause injury or death to personnel.
- When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- A turbocharger may become very hot and requires more time to cool down than other parts of engine assembly. Shut down generator set and allow it to cool sufficiently before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

## MALFUNCTION

Exhaust manifold gasket leak.

### CORRECTIVE ACTION

- STEP 1. Inspect exhaust manifold and cylinder head for discoloration or burning around exhaust outlet ports.
- STEP 2. Replace exhaust manifold gasket if discoloration or burning is found (WP 0086, Remove/Install Exhaust Manifold).
- STEP 3. If symptom continues, troubleshoot IAW Abnormal sound heard from exhaust system with a decrease in engine performance symptom.

## SYMPTOM

Buzzing or rattling sound heard.

## MALFUNCTION

Loose or missing hardware of exhaust component.

## **CORRECTIVE ACTION**

### **WARNING**

- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- Hot exhaust gases can ignite combustible materials. Allow room for safe discharge of hot gases. Failure to comply may cause injury or death to personnel.
- When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- A turbocharger may become very hot and requires more time to cool down than other parts of engine assembly. Shut down generator set and allow it to cool sufficiently before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
  - STEP 1. Check for loose or missing fasteners attaching heat shield to exhaust manifold (WP 0086, Remove/Install Exhaust Manifold).
  - STEP 2. Tighten any loose fasteners and replace any missing fasteners (WP 0086, Remove/Install Exhaust Manifold).
  - STEP 3. Use a small pry bar to gently press on heat shield to check for broken welds or damage. Replace as required (WP 0086, Remove/Install Exhaust Manifold).
  - STEP 4. Check muffler hardware and fasteners for loose fasteners, missing parts, or broken welds. Replace or repair as required (WP 0084, Remove/Install Muffler).
  - STEP 5. Check exhaust outlet connection at turbocharger, muffler connections, and exhaust pipes for missing clamps, loose hardware, or damage. Replace or tighten hardware as required (WP 0084, Remove/Install Muffler).

## **SYMPTOM**

Engine emits blue or black smoke with insufficient engine output.

### **MALFUNCTION**

Overloaded generator set.

### **CORRECTIVE ACTION**

- STEP 1. Increase generator set size or reduce load usage.
- STEP 2. Troubleshoot electrical system for load problems (WP 0009, Electrical System Troubleshooting without a DCS Code).
- STEP 3. If symptoms continue, proceed to next malfunction.

### **MALFUNCTION**

Dirty air cleaner element.

**CORRECTIVE ACTION**

STEP 1. Check the air cleaner element and service air cleaner assembly as needed (WP 0020, Service Air Cleaner).

STEP 2. If symptoms continue, proceed to next malfunction.

**MALFUNCTION**

Obstruction in air intake system.

**CORRECTIVE ACTION**

STEP 1. Check air intake hoses for kinks, damage, or signs of restriction. Replace as required (WP 0019, Remove/Install Air Intake Hose Assemblies).

STEP 2. Inspect intake air heater for malfunction or blockage causing restriction to air flow. Replace as required (WP 0082, Remove/Install Air Intake Heater).

STEP 3. Inspect intake manifold for cracks or damage. Inspect air intake hose to intake manifold. Replace either as required (WP 0083, Remove/Install Intake Manifold).

STEP 4. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

High back pressure or restriction in exhaust system.

**CORRECTIVE ACTION****WARNING**

- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- Hot exhaust gases can ignite combustible materials. Allow room for safe discharge of hot gases. Failure to comply may cause injury or death to personnel.
- When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- A turbocharger may become very hot and requires more time to cool down than other parts of engine assembly. Shut down generator set and allow it to cool sufficiently before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

STEP 1. Check exhaust outlet on top of generator set to be sure it is clear of obstructions (WP 0084, Remove/Install Muffler).

STEP 2. Check that protection cap is operating properly. Repair or replace as required (WP 0084, Remove/Install Muffler).

STEP 3. Check pipes throughout exhaust system for dents or kinks that could be causing restriction in the exhaust system. Replace or repair as required (WP 0084, Remove/Install Muffler).

- STEP 4. Remove flex pipe and inspect muffler for visual damage, restriction, or excess carbon buildup. Remove restrictions, install or replace flex pipe as required, or replace muffler as required (WP 0084, Remove/Install Muffler).
- STEP 5. Inspect exhaust manifold for signs of damage or restriction. Remove restrictions or replace if necessary (WP 0086, Remove/Install Exhaust Manifold).
- STEP 6. Inspect turbocharger for restrictions, damage, or improper function and replace turbocharger as required (WP 0085, Remove/Install Turbocharger).
- STEP 7. If symptom continues, proceed to next malfunction.

#### **MALFUNCTION**

Improper or contaminated fuel.

#### **CORRECTIVE ACTION**

- STEP 1. Drain fuel tank and refill with clean fuel (WP 0044, Service Fuel System).
- STEP 2. Drain fuel filter/water separator (TM 9-6115-752-10) and replace fuel filter/water separator element (WP 0048, Replace Fuel Filter/Water Separator Element).
- STEP 3. If symptom continues, proceed to next malfunction.

#### **MALFUNCTION**

Improper open or close timing of intake/exhaust valves.

#### **CORRECTIVE ACTION**

- STEP 1. Adjust valve clearance (WP 0090, Check/Adjust Valves).
- STEP 2. If symptom continues, proceed to next malfunction.

#### **MALFUNCTION**

Too much oil in oil pan/too much oil added.

#### **CORRECTIVE ACTION**

- STEP 1. Drain oil to obtain proper level (WP 0068, Service Lubrication System).
- STEP 2. If symptom continues, proceed to next malfunction.

#### **MALFUNCTION**

Engine used at high temperatures or at high altitude.

#### **CORRECTIVE ACTION**

- STEP 1. Adjust governor gain and/or reduce load as required (WP 0017, Remove/Install DCS).
- STEP 2. If symptom continues, proceed to next malfunction.

#### **MALFUNCTION**

Turbocharger assembly waste gate malfunction.



**CORRECTIVE ACTION****WARNING**

A turbocharger may become very hot and requires more time to cool down than other parts of engine assembly. Shut down generator set and allow it to cool sufficiently before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

STEP 1. Inspect turbocharger and replace as required (WP 0085, Remove/Install Turbocharger).

STEP 2. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Fuel injection malfunction.

**CORRECTIVE ACTION**

STEP 1. Check fuel injection lines for loose nuts or leakage. Repair or replace as required (WP 0074, Test/Replace Fuel Injectors).

STEP 2. If symptom continues, test fuel injectors and replace as required (WP 0074, Test/Replace Fuel Injectors).

STEP 3. If symptom continues, test high-pressure fuel pump and replace as required (WP 0075, Remove/Install High-Pressure Fuel Pump).

STEP 4. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Internal engine problem.

**CORRECTIVE ACTION**

STEP 1. Test engine compression (WP 0103, Replace Cylinder Head Gasket).

STEP 2. Replace cylinder head gasket or engine as required (WP 0103, Replace Cylinder Head Gasket and WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).

**SYMPTOM**

Engine emits white exhaust smoke.

**MALFUNCTION**

Fuel contaminated or improper fuel used.

**CORRECTIVE ACTION**

STEP 1. Inspect fuel type being used and check with specification on labels and in manual (TM 9-6115-752-10).

STEP 2. Drain fuel tank and refill with clean fuel (WP 0044, Service Fuel System).

STEP 3. Replace fuel filter/water separator element (WP 0048, Replace Fuel Filter/Water Separator Element).

STEP 4. If symptom continues, proceed to next malfunction.

## **MALFUNCTION**

Clogged exhaust pipe or muffler.

## **CORRECTIVE ACTION**

### **WARNING**

- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- Hot exhaust gases can ignite combustible materials. Allow room for safe discharge of hot gases. Failure to comply may cause injury or death to personnel.
- When operating, exhaust system has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- A turbocharger may become very hot and requires more time to cool down than other parts of engine assembly. Shut down generator set and allow it to cool sufficiently before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

STEP 1. Check exhaust outlet on top of generator set to be sure it is clear of obstructions (WP 0084, Remove/Install Muffler).

STEP 2. Check that protection cap is operating properly. Repair or replace as required (WP 0084, Remove/Install Muffler).

STEP 3. Check pipes throughout exhaust system for dents or kinks that could be causing restriction in the exhaust system. Replace or repair as required (WP 0084, Remove/Install Muffler).

STEP 4. Remove flex pipe and inspect muffler for visual damage, restriction, or excess carbon buildup. Remove restrictions, install or replace flex pipe as required, or replace muffler as required (WP 0084, Remove/Install Muffler).

STEP 5. Inspect exhaust manifold for signs of damage or restriction. Remove restrictions or replace if necessary (WP 0086, Remove/Install Exhaust Manifold).

STEP 6. Inspect turbocharger for restrictions, damage, or improper function (WP 0085, Remove/Install Turbocharger).

STEP 7. If symptom continues, proceed to next malfunction.

## **MALFUNCTION**

Clogged air filter.

## **CORRECTIVE ACTION**

STEP 1. Inspect and replace air filter as required (TM 9-6115-752-10).

STEP 2. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Improper intake and exhaust valve open/closure.

**CORRECTIVE ACTION**

STEP 1. Adjust engine valves (WP 0090, Check/Adjust Valves).

STEP 2. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Turbocharger lube oil line or outlet oil line leak.

**CORRECTIVE ACTION****WARNING**

A turbocharger may become very hot and requires more time to cool down than other parts of engine assembly. Shut down generator set and allow it to cool sufficiently before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

STEP 1. Inspect lube oil line and outlet line for leaks and replace as required (WP 0085, Remove/Install Turbocharger).

STEP 2. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Engine used at high temperatures or at high altitude.

**CORRECTIVE ACTION**

STEP 1. Reduce load as required.

STEP 2. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Fuel injection malfunction.

**CORRECTIVE ACTION**

STEP 1. Check fuel injection lines for loose nuts or leakage. Repair or replace as required (WP 0074, Test/Replace Fuel Injectors).

STEP 2. If symptom continues, test fuel injectors and replace fuel injectors as required (WP 0074, Test/Replace Fuel Injectors).

STEP 3. If symptom continues, test high-pressure fuel pump and replace as required (WP 0075, Remove/Install High-Pressure Fuel Pump).

STEP 4. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Internal engine problem.

**CORRECTIVE ACTION**

STEP 1. Test engine compression (WP 0103, Replace Cylinder Head Gasket).

STEP 2. Replace cylinder head gasket or engine as required (WP 0103, Replace Cylinder Head Gasket and WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**WINTERIZATION KIT TROUBLESHOOTING**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Personnel Required**

91D (1)

**References**

TM 9-6115-752-10

WP 0008, Electrical System Troubleshooting with a DCS Code

WP 0009, Electrical System Troubleshooting without a DCS Code

WP 0016, Field PMCS

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

**References**

WP 0026, Remove/Install Winterization Kit Components

WP 0037, Remove/Install Batteries

WP 0039, Remove/Install Engine Wiring Harness

WP 0041, Remove/Install Main DC Circuit Breaker

WP 0044, Service Fuel System

WP 0079, Remove/Install Battery-Charging Alternator

WP 0100, General Maintenance

Foldout Pages

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**WINTERIZATION KIT TROUBLESHOOTING****NOTE**

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0016, Field PMCS).

Read the entire corrective action sequence before beginning steps to complete corrective action for a malfunction.

FAULT RESET switch must be pushed to clear each fault code as it is addressed.

Capture spilled fuel and dispose of IAW local SOP.

**SYMPTOM**

[Warning 3663: Winterization Kit Failure to Heat] displayed on DCS screen.

**WARNING**

Eye protection is required when working with compressed air. Do not use compressed air to clean skin. Do not aim at personnel. Compressed air can propel particles at high velocity and injure eyes. Failure to comply may cause injury or death to personnel.

**NOTE**

[Warning 3663: Winterization Kit Failure to Heat] displays on DCS when coolant temperature fails to rise 5°F (2.75°C) in 5 min.

**MALFUNCTION**

Fuel tank is empty.

**CORRECTIVE ACTION****NOTE**

Capture spilled fuel and dispose of IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

STEP 1. Fill fuel tank as required (WP 0044, Service Fuel System).

STEP 2. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Clogged intake port.

**CORRECTIVE ACTION****WARNING**

Eye protection is required when working with compressed air. Do not use compressed air to clean skin. Do not aim at personnel. Compressed air can propel particles at high velocity and injure eyes. Failure to comply may cause injury or death to personnel.

STEP 1. Clean air intake port with compressed air (located next to exhaust pipe port (WP 0026, Remove/Install Winterization Kit Components)).

STEP 2. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Clogged exhaust pipe.

**CORRECTIVE ACTION**

STEP 1. Remove exhaust pipe (WP 0026, Remove/Install Winterization Kit Components).

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## WARNING

Eye protection is required when working with compressed air. Do not use compressed air to clean skin. Do not aim at personnel. Compressed air can propel particles at high velocity and injure eyes. Failure to comply may cause injury or death to personnel.

STEP 2. Clean exhaust pipe with compressed air.

STEP 3. If symptom continues, proceed to next malfunction.

## MALFUNCTION

Clogged winterization kit fuel pump or malfunctioning fuel pump.

## CORRECTIVE ACTION

## NOTE

Capture spilled fuel and dispose of IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

STEP 1. Perform fuel flow test (WP 0026, Remove/Install Winterization Kit Components).

STEP 2. Test and replace fuel system components (WP 0044, Service Fuel System) or winterization kit if necessary (WP 0026, Remove/Install Winterization Kit Components).

STEP 3. If symptom continues, proceed to next malfunction.

## MALFUNCTION

Winterization kit wiring or DCS failure.

## CORRECTIVE ACTION

## WARNING

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

## NOTE

CB201-LOAD/P20A-1 (positive battery current) runs between main DC circuit breaker (CB201) and winterization kit (L20). Winterization kit wires P2-R (signal) and P2-U (negative) run between DCS P2 and winterization kit connectors.

Wire P2-R runs between DCS P2 and P20A at winterization kit. J20C-4 runs from plug P20A (pin 2) on winterization kit (L20, BROWN) and J20C-2 runs from P21-2 (plug of fuel metering pump (M21, pin 2)). Both wires junction at J20C. Wire P2-U is the return from J20C to DCS P2. P20A-4 (green) runs between winterization kit and fuel metering pump (P21-1 to M21).

STEP 1. Use wiring diagrams (Foldout Pages) to locate and check winterization kit wiring at P20A, P21, J20C, CB201, and DCS P2 for loose connections and bent or broken pins.

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- STEP 2. Install connections or repair or replace wiring or connectors as required (WP 0039, Remove/Install Engine Wiring Harness; WP 0041, Remove/Install Main DC Circuit Breaker; and WP 0100, General Maintenance).
- STEP 3. If symptom continues, turn engine control switch to PRIME & RUN without starting generator set (TM 9-6115-752-10), remove connector P20A from winterization kit, and check voltage between pins P20A-1 and P20A-2 using a multimeter set to test VDC (WP 0100, General Maintenance).
- STEP 4. If voltage is greater than 21 VDC, proceed to STEP 10.
- STEP 5. If voltage is equal to or less than 21 VDC, proceed to STEP 6.
- STEP 6. Install P20A and test batteries. Charge or replace as required (WP 0037, Remove/Install Batteries).
- STEP 7. If symptom continues, remove battery ground cable (WP 0037, Remove/Install Batteries), remove wires from components as required, and use wiring diagrams and a multimeter set to test continuity to check CB201-LOAD and P2-U for opens or shorts (WP 0100, General Maintenance and Foldout Pages).
- STEP 8. Replace or repair wiring as required (WP 0100, General Maintenance and WP 0039, Remove/Install Engine Wiring Harness).
- STEP 9. If symptom continues, test DCS LEDs and replace DCS as required (WP 0018, Repair DCS and WP 0017, Remove/Install DCS). Resume operation.
- STEP 10. Leave P20A unplugged and select winterization kit test from DCS screen (TM-9-6115-752-10).
- STEP 11. Use a multimeter set to test VDC to check voltage between pins P20A-7 and P20A-2 (WP 0100, General Maintenance).
- STEP 12. Record voltage and stop winterization kit test (TM-9-6115-752-10).
- STEP 13. If voltage is greater than 21 VDC, proceed to STEP 17.
- STEP 14. If voltage is equal to or less than 21 VDC, remove battery ground cable (WP 0037, Remove/Install Batteries) and use wiring diagrams and a multimeter set to test Ohms to check wire P2-R for shorts or opens (WP 0100, General Maintenance and Foldout Pages).
- STEP 15. Repair or replace wire P2-R as required (WP 0100, General Maintenance and WP 0039, Remove/Install Engine Wiring Harness).
- STEP 16. If symptom continues, troubleshoot IAW Defective DCS malfunction under DCS has no power or no lighted display symptom (WP 0009, Electrical Troubleshooting without a DCS Code).
- STEP 17. Select winterization kit test from DCS screen (TM-9-6115-752-10) and proceed to STEP 18.
- STEP 18. Install P20A to winterization kit and remove P21 from fuel metering pump at winterization kit.
- STEP 19. Use a multimeter set to test VDC to check voltage between pins P21-1 and P21-2 (WP 0100, General Maintenance).
- STEP 20. If voltage is within 11.97 to 14.63 VDC range, replace fuel metering pump (WP 0026, Remove/Install Winterization Kit Components).
- STEP 21. If voltage is not within 11.97 to 14.63 VDC range, remove battery ground cable (WP 0037, Remove/Install Batteries) and a multimeter set to test continuity with wiring diagrams to check connector J20C and wires P20A-4 (green), J20C-2, and P2-U for opens or shorts (WP 0100, General Maintenance and Foldout Pages).



STEP 22. Repair or replace wires or connectors as required (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).

STEP 23. If symptom continues, replace winterization kit (WP 0026, Remove/Install Winterization Kit Components).

## SYMPTOM

[Warning 3671: Winterization Kit Low Voltage Warning] displayed on DCS screen.

## WARNING

The right-hand battery negative lead that connects directly to the grounding stud must be disconnected prior to disconnecting or removing batteries. Follow procedural steps in exact order given for removal and installation. Failure to comply may cause injury or death to personnel.

## NOTE

When [Warning 3671: Winterization Kit Low Voltage Warning] appears on DCS screen, winterization kit is draining the batteries or DCS is reading the signal as a battery drain signal. The batteries are below 20 VDC when [Warning 3671: Winterization Kit Low Voltage Warning] appears on DCS screen.

## MALFUNCTION

Battery connections are loose or batteries are insufficiently charged.

## CORRECTIVE ACTION

- STEP 1. Check for corroded or loose battery connections. Clean/replace corroded battery connections and tighten loose battery connections as required (WP 0037, Remove/Install Batteries).
- STEP 2. Check DCS voltage meter for a reading less than 20 VDC indicating battery voltage is low (TM 9-6115-752-10).
- STEP 3. If battery voltage is not low, proceed to next malfunction.
- STEP 4. If battery voltage is low, use a multimeter selected for the appropriate VDC scale to measure the voltage of each battery at the battery terminals (WP 0100, General Maintenance and WP 0037, Remove/Install Batteries).
- STEP 5. Charge batteries, start engine utilizing the NATO slave receptacle and an outside power source or replace batteries as required (WP 0037, Remove/Install Batteries; WP 0100, General Maintenance; and TM 9-6115-752-10).
- STEP 6. Start generator set and observe DCS [Battery] [Adc] indicator to ensure battery-charging alternator is charging batteries properly (TM 9-6115-752-10). Test battery-charging alternator if batteries are not charging properly and replace as required (WP 0079, Remove/Install Battery-Charging Alternator).
- STEP 7. If symptom continues, proceed to next malfunction.

**MALFUNCTION**

Winterization kit wiring or DCS failure.

**CORRECTIVE ACTION**

Troubleshoot IAW Winterization kit wiring or DCS failure malfunction under [Warning 3663: Winterization Kit Failure to Heat] displayed on DCS screen symptom.

**SYMPTOM**

Winterization kit fails to turn off.

**MALFUNCTION**

Defective flame or heat sensor.

**CORRECTIVE ACTION**

Troubleshooting IAW Winterization kit activates under usual operating conditions symptom.

**SYMPTOM**

Winterization kit activates under usual operating conditions.

**MALFUNCTION**

Defective temperature sensor or DCS temperature sensor.

**CORRECTIVE ACTION**

STEP 1. Test temperature sensor IAW [Warning 144: Coolant Temp Sensor OOR High] displayed on DCS screen symptom (WP 0008, Electrical System Troubleshooting with a DCS Code).

STEP 2. If symptom continues, troubleshoot IAW Winterization kit wiring or DCS failure malfunction under [Warning 3663: Winterization Kit Failure to Heat] displayed on DCS screen symptom.

**END OF WORK PACKAGE**

**CHAPTER 3**

**FIELD MAINTENANCE INSTRUCTIONS**

**FOR**

**AMMPS 30KW GENERATOR SET**

## CHAPTER 3

## FIELD MAINTENANCE INSTRUCTIONS

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**SERVICE UPON RECEIPT**

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**INITIAL SETUP:****Test Equipment**

Load Bank (WP 0179, Table 2, Item 2)  
**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Belt, V-drive (5/8 inch X 52 inch) (WP 0147, Repair Parts List, Figure 42, Item 11)

Element, lubricating oil filter (WP 0136, Repair Parts List, Figure 31, Item 12)

Antifreeze, ethylene glycol (WP 0180, Expendable and Durable Items List, Item 2)

Bag, barrier (WP 0180, Item 3)

Cap set, protective (WP 0180, Item 8)

Cleaning compound, engine cooling system (WP 0180, Item 10)

Distilled water (WP 0180, Item 19)

Fuel, diesel (WP 0180, Item 20)

Fuel, diesel (WP 0180, Item 21)

Grease, electrically conductive (WP 0180, Item 22)

Lubricating oil, engine (WP 0180, Item 25)

Lubricating oil, engine (WP 0180, Item 26)

Lubricating oil, engine (WP 0180, Item 27)

Rag, wiping (WP 0180, Item 33)

Sealant (WP 0180, Item 34)

**Personnel Required**

91D (1)

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**References**

A-A-52557A

DA Form 2258

DA PAM 750-8

MIL-PRF-2104H

MIL-PRF-22191F

MIL-PRF-46167D

MIL-STD-129

SF 361

WP 0015, Field PMCS Introduction

WP 0016, Field PMCS

WP 0022, Service Cooling System

WP 0037, Remove/Install Batteries

WP 0044, Service Fuel System

WP 0068, Service Lubrication System

WP 0080, Remove/Install Battery-Charging Alternator Belt

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

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## WARNING

- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.
- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator set is running. Failure to comply may cause injury or death to personnel.
- High voltage is produced when this generator set is in operation. Do not contact output cables when operating this generator set. Failure to comply may cause injury or death to personnel.
- The right-hand battery negative lead that connects directly to the grounding stud must be disconnected prior to disconnecting or removing batteries. Follow procedural steps in exact order given for removal and installation. Failure to comply may cause injury or death to personnel.
- Batteries give off combustible gas. Do not smoke or use open flame when performing maintenance. Failure to comply may cause injury or death to personnel and damage to equipment.
- Battery acid can cause burns to skin and cause eye injury. Wear safety goggles and chemical gloves and avoid acid splash while working on the batteries. Failure to comply may cause injury or death to personnel.
- Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.
- Lifting batteries may cause back strain. Ensure proper lifting techniques are used when lifting batteries. Failure to comply may cause injury or death to personnel.
- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (fuel fill static ground). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate ESD. Fire and possible explosion can result. Failure to comply may cause injury or death to personnel.



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## WARNING

- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.
- Hot exhaust gases can ignite combustible materials. Allow room for safe discharge of hot gases. Failure to comply may cause injury or death to personnel.
- Wear heat resistant gloves and avoid contacting hot metal surfaces with hands and exposed skin after components have been heated. Wear additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Comply with all lifting requirements. Observe the decals on equipment and parts that identify the weight and determine if assistance is needed. Maximum lift is 37lb (16.8 kg) for one person, 74 lb (33.6 kg) for two persons, and 101 lb (45.8 kg) for three persons. Failure to comply may cause injury or death to personnel.
- When lifting generator set, use lifting equipment with minimum lifting capacity of 3200 lb (1451.5 kg). Do not stand or put arms, legs, or any body part under hoisted load. Do not permit generator set to swing. Failure to comply may cause injury or death to personnel.
- Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.

## CAUTION

While filling the coolant, air must be vented from the engine coolant passages. Vent air by opening pressure release valve and pouring slowly into the filler opening. Failure to comply may cause damage to equipment.

Be sure to close radiator cap securely to avoid coolant leakage. Engine may overheat if cap is loose. Failure to comply may cause damage to equipment.

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

Do not move or lift batteries by the terminal studs. Failure to comply will cause damage to equipment.

## NOTE

Capture spilled fuel/coolant and dispose of IAW local SOP.

This WP provides information and guidance for service upon receipt of the AMMPS 30 kW generator set. These procedures ensure the AMMPS unit is adequately inspected, serviced, sited, and operationally tested before being subjected to use.

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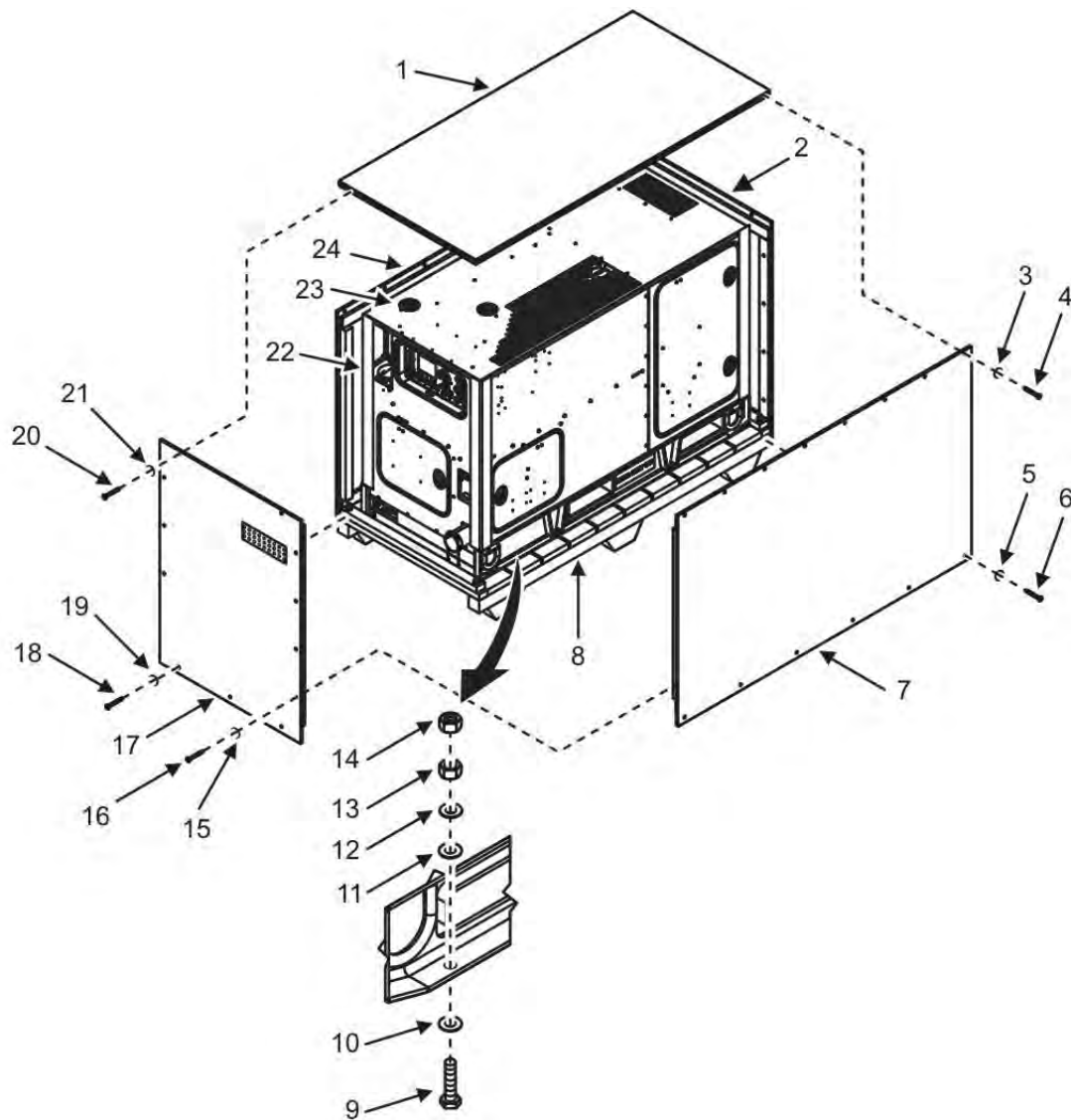
**SITING**

See the siting requirements contained in TM 9-6115-752-10.

**SERVICE UPON RECEIPT OF MATERIEL****Unpacking****NOTE**

The generator set should take approximately 0.5 hours to unpack.

1. Inspect all packaging for damage incurred during transit. See Checking Equipment task and Table 1.
2. Remove 20 lag bolts (Figure 1, Items 4 and 20) and washers (Figure 1, Items 3 and 21) securing top (Figure 1, Item 1) of plywood box.
3. Remove top (Figure 1, Item 1) of plywood box.
4. Remove 11 lag bolts (Figure 1, Items 16 and 18) and washers (Figure 1, Items 15 and 19) from front end (Figure 1, Item 17) of plywood box.
5. Remove front end (Figure 1, Item 17) of plywood box and set aside.
6. Repeat for inspection end (Figure 1, Item 2) of plywood box being sure to remove lag bolts (Figure 1, Item 16) and washers (Figure 1, Item 15) securing side panels.



**Figure 1. Generator Set Unpacking.**

7. Remove inspection end (Figure 1, Item 2) of plywood box and set aside.
8. Remove six lag bolts (Figure 1, Item 6) and washers (Figure 1, Item 5) from right side (Figure 1, Item 7) of plywood box.
9. Remove right side (Figure 1, Item 7) of plywood box and set aside.
10. Repeat for left side (Figure 1, Item 24) of plywood box. Remove left side (Figure 1, Item 24) of plywood box and set aside.
11. Check humidity gage (not shown) at rear side of generator set (Figure 1, Item 2) for color change and record reading.
12. Report any abnormal reading IAW Checking Equipment task, step 2.
13. Remove polyethylene bag (not shown) and paperboard corner protectors (Figure 1, Item 22).
14. Remove eight nuts (Figure 1, Items 13 and 14), four lock washers (Figure 1, Item 12), and four washers (Figure 1, Item 11) securing generator set (Figure 1, Item 23) to bolts (Figure 1, Item 9) on wooden pallet (Figure 1, Item 8).

15. Lift generator set (Figure 1, Item 23) clear of wooden pallet (Figure 1, Item 8) using a suitable lifting device.
16. Remove four bolts (Figure 1, Item 9) and four washers (Figure 1, Item 10) from underneath wooden pallet (Figure 1, Item 8).
17. Stack all side and end panels (Figure 1, Items 1, 7, 17, and 24) on wooden pallet (Figure 1, Item 8) and save for reuse.
18. Package all lag bolts (Figure 1, Items 4, 6, 16, 18, and 20), bolts (Figure 1, Item 9), washers (Figure 1, Items 10 and 11) and nuts (Figure 1, Items 13 and 14) and store with wooden pallet (Figure 1, Item 8) for reuse.
19. Dispose of all packaging materials for the 30kW generator IAW local SOP.
20. Store wooden pallet (Figure 1, Item 8), sides and ends (Figure 1, Items 1, 7, 17, and 24), and hardware (Figure 1, Items 3, 4, 5, 6, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20 and 21) for the 30 kW generator set IAW local SOP.

## END OF TASK

### Packing

1. Ensure oil level is full and fill as required (WP 0068, Service Lubrication System).
2. Service cooling system (WP 0022, Service Cooling System).
3. Run engine for at least 5 min to preserve cooling system (TM 9-6115-752-10).
4. Shut down generator set and allow engine to cool.
5. Prepare generator set IAW Preparation for Movement WP (TM 9-6115-752-10).
6. Ensure auxiliary fuel lines and paralleling cables are stored in the proper storage box within the generator set (TM 9-6115-752-10).
7. Ensure technical publications are sealed into plastic bag IAW MIL-PRF-22191F, Performance Specification, Barrier Materials, Transparent, Flexible, Heat-Sealable and stored in document box (TM 9-6115-752-10).
8. Ensure one copy of DA Form 2258, Depreservation Guide of Engineering Equipment is stored in plastic bag in the document box IAW MIL-B-22191.
9. Attach one copy of DA Form 2258, Depreservation Guide of Engineering Equipment stored in plastic bag IAW MIL-B-22191 to outside of generator set.
10. Position wooden pallet (Figure 1, Item 8) on a level surface.
11. Position generator set (Figure 1, Item 23) on wooden pallet (Figure 1, Item 8) using a suitable lifting device.
12. Secure generator set (Figure 1, Item 23) to wooden pallet (Figure 1, Item 8) with one washer (Figure 1, Item 11), one new lock washer (Figure 1, Item 12) and two nuts (Figure 1, Items 13 and 14) on one bolt (Figure 1, Item 9) with washer (Figure 1, Item 10).
13. Repeat for three other bolts and hardware securing generator set (Figure 1, Item 23) to wooden pallet (Figure 1, Item 8).
14. Position right side (Figure 1, Item 7) of plywood box on wooden pallet (Figure 1, Item 8) using six lag bolts (Figure 1, Item 6) and washers (Figure 1, Item 5) to secure to wooden pallet (Figure 1, Item 8).
15. Repeat for left side (Figure 1, Item 24) of plywood box.
16. Position front end (Figure 1, Item 17) of plywood box on wooden pallet (Figure 1, Item 8) using three lag bolts (Figure 1, Item 18) and washers (Figure 1, Item 19).
17. Install four lag bolts (Figure 1, Item 16) and washers (Figure 1, Item 15) to each side of front end (Figure 1, Item 17) of plywood box to secure to left and right sides (Figure 1, Items 7 and 24).
18. Position inspection end (Figure 1, Item 2) of plywood box on wooden pallet (Figure 1, Item 8) and secure with lag bolts and washers.

19. Install top (Figure 1, Item 1) of plywood box.
20. Install two lag bolts (Figure 1, Item 20) and washers (Figure 1, Item 21) to top of each end (Figure 1, Items 2 and 17) of plywood box and eight lag bolts (Figure 1, Item 4) and washers (Figure 1, Item 3) to top of each side (Figure 1, Items 7 and 24) of plywood box.
21. Inspect to ensure box is adequately sealed and assembled correctly.
22. Label box IAW MIL-STD-129, Military Marking Practices for Shipment and Storage, as required.

## END OF TASK

### Checking Equipment

**Table 1. Inspection Criteria for Packaging.**

Component	Acceptable	Reparable	Nonreparable
Wooden Boxes and Crates			
Hardware	Operative and tight. Lag bolts, nuts, washers.	Inoperative or loose. Lag bolts, nuts, washers.	None.
Ends	Free from damage.	Broken or missing portions.	Damage that requires disassembly of box.
Wood	Splits less than 3 in (7.62 cm) long, no closer than 1 in (2.54 cm) to edge of board or adjoining split. The board must be secured by at least one lag bolt on each side of the split when it extends to the end of the board.	Splits more than 3 in (7.62 cm) but no closer than 1 in (2.54 cm) to edge of board or adjoining split or 1/2 in (12.7 cm) wide that can be repaired by use of corrugated fasteners.	Splits closer than 1 in (2.54 cm) to edge of board or adjoining split or over 1/2 in (1.27 cm) wide.

1. Ensure all authorized components, materials, and accessories are present upon receipt of the 30 kW generator set by checking the equipment against the packing slips to see if the shipment is complete.
2. Check to see if the equipment has been modified and report all discrepancies IAW applicable service instructions (for Army instructions, see DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual).
3. Inspect the equipment for any exterior or interior damage incurred during shipment.
4. Report any damaged item(s) IAW the instructions in the warranty technical bulletin and note the damage on SF 361, Transportation Discrepancy Report (TDR).
5. Check that all packing materials have been removed and are in "Acceptable" condition. See Table 1.
6. Inspect generator set assemblies, subassemblies, and accessories for any internal or external shipping damage.
7. Check generator set identification plates for positive identification (TM 9-6115-752-10).
8. Inspect generator set for loose or missing mounting hardware or damaged or missing parts.
9. Open left-side door and inspect batteries for damage.
10. Check battery cables for damage.
11. Open output terminal door and check output terminals and cover for damage.

12. Check output terminal board for loose wires or damage.
13. Open DCS cover and visually check DCS for damage.
14. Check air cleaner assembly and exhaust opening for obstruction or damage.
15. Check battery-charging alternator belt for proper adjustment (WP 0080, Remove/Install Battery-Charging Alternator Belt).
16. Open grounding rod compartment door on front panel and ensure items are complete and free of damage.
17. Open right-side door and ensure auxiliary hose is in place and free of damage.

**END OF TASK****INSTALLATION INSTRUCTIONS****Batteries**

For battery service, see WP 0037, Remove/Install Batteries.

**END OF TASK****Radiator****NOTE**

This unit normally ships without lubricant, coolant, or fuel.

For radiator service, see WP 0022, Service Cooling System.

**END OF TASK****Fuel Tank****NOTE**

This unit normally ships without lubricant, coolant, or fuel.

1. Check that fuel drain valve (WP 0044, Service Fuel System) is closed.
2. Fill generator set fuel tank (TM 9-6115-752-10) with fuel type specified in Table 2. Fuel capacity is 16.7 gal (63.22 L).

**Table 2. Fuel.**

<b>AMBIENT TEMPERATURE</b>	<b>FUEL</b>
-50°F to +135°F (-45.6°C to 57.2°C)	JP8
+25°F to +135°F (-3.9°C to 57.2°C)	A-A-52557A <sup>a</sup> GR 2-D
0°F to +20°F (-17.7°C to -6.7°C)	A-A-52557A GR 1-D

<sup>a</sup> Fuel Oil, Diesel; for Posts, Camps and Stations.

**END OF TASK**

## Installation of Ground Rod

Ground the AMMPS unit IAW (TM 9-6115-752-10).

## END OF TASK

## PRELIMINARY SERVICING OF EQUIPMENT

### Lubricating Oil

### NOTE

This unit normally ships without lubricant, coolant, and fuel.

1. Remove dipstick to check for presence of engine oil (WP 0068, Service Lubrication System).
2. Fill engine with proper engine oil IAW Table 3 to FULL mark on dipstick (WP 0068, Service Lubrication System). Lubrication system capacity is 8.5 qt (8.04 L).

**Table 3. Lubricating Oil.**

AMBIENT TEMPERATURE	SPECIFICATION	CAPACITY	EXPECTED TEMPERATURES
+5°F to +135°F (-15°C to 57°C)	MIL-PRF-2104H <sup>a</sup> OE/HDO 15W40	Crankcase and engine 8.5 qt (8.04 L) with filter	Not Applicable
-15°F to +5°F (-26°C to -15°C)	MIL-PRF-2104H OE/HDO-10		
-50°F to +40°F (-45°C to 4°C)	MIL-PRF-46167D <sup>b</sup>		

<sup>a</sup> Performance Specification, Lubrication Oil, Internal Combustion Engine, Combat/Tactical Service.

<sup>b</sup> Performance Specification, Lubrication Oil, Internal Combustion Engine, Arctic.

## END OF TASK

## PRELIMINARY CHECKS AND ADJUSTMENT OF EQUIPMENT

Checks and adjustments shall be made on all newly installed 30 kW generator sets. Information on the location of items such as controls and components is located in individual WPs. Before any equipment is put into use, checks are required to ensure proper operation of the equipment.

### NOTE

To conduct some of these preliminary checks and adjustments, it is necessary to run the AMMPS unit under load.

1. Perform before PMCS (TM 9-6115-752-10).
2. Inspect panels, access doors, and plates.
3. Check for grounding, including earth ground circuits and earth conditioning for conduction, as well as a check of the grounding circuit for negligible resistance.
4. Check for firm seating and connection of all plug-in parts, mating connectors, jacks, and plugs.
5. Check cable and wiring harness routing, dressing, and fastening.
6. Check operation of safety interlocks and switches.

- 
7. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
  8. Start unit and generate electrical load at a frequency of 50 Hz and 60 Hz for MEP-1060 and 400 Hz for MEP-1061 (TM 9-6115-752-10).
  9. Turn engine control switch to OFF (TM 9-6115-752-10) when generator set has reached normal operating temperature, voltage, and frequency.
  10. Check content and operation of liquid cooling systems (WP 0022, Service Cooling System).
  11. Complete lubricants and CPC procedures (WP 0015, Field Maintenance PMCS Introduction).
  12. Check terminal connections (TM 9-6115-752-10).
  13. Perform after PMCS (TM 9-6115-752-10) on 30 kW generator set.

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**FIELD PMCS INTRODUCTION**

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**INTRODUCTION**

This section contains information you will need to perform field maintenance PMCS. Steps are included to help you perform these procedures easily and quickly. PMCS consist of scheduled maintenance items used to make sure the AMMPS are ready for operation at all times. Inspect the system regularly and carefully so you can find, correct, and prevent any defects.

**GENERAL**

PMCS are performed to keep the equipment in operating condition. The checks are used to find, correct, or report problems. Pay attention to warning and caution statements. A warning indicates the possibility of injury or death to personnel. A caution means the potential for equipment damage.

Intervals are given in operating hours, calendar intervals, or in both operating hours and calendar intervals. Check or service should be performed using interval that occurs first when both operating hours and calendar intervals are given.

- First 50 hours.
- Every 250 hours.
- Every 750 hours.
- Every 1000 hours.
- Every 1500 hours.
- Every 250 hours or every 3 months.
- Every 500 hours or every 6 months.
- Every 750 hours or every 6 months.
- Every 2000 hours or every 2 years.
- Every 5000 hours or every 4 years.
- Under harsh environmental conditions, PMCS should be conducted more frequently.

**EXPLANATION OF THE COLUMNS FOUND IN THE PMCS TABLE**

Column (1) – Item No. The item number lists the checks and services in the order they are to be completed. This column will be used as a source of item for the TM Number Column on DA Form 2404, Equipment Inspection and Maintenance Worksheet, or DA Form 5988E (electronic version), Equipment Inspection and Maintenance Worksheet, in recording the result of the PMCS.

Column (2) – Interval. References when the PMCS should be performed.

Column (3) – Item to be Checked or Serviced. Identifies the portion of the system to be inspected.

Column (4) – Procedure. Provides the procedures for performing the checks.

Column (5) – Equipment is not Ready/Available if. Contains the criteria that will render the system incapable of performing its primary mission. If the system does not perform as required, refer to Chapter 2, Field Maintenance Troubleshooting (WP 0004, Troubleshooting Index). If equipment appears to be malfunctioning and the problem cannot be fixed, immediately report it to your supervisor and report it on DA Form 2404, Equipment Inspection and Maintenance Worksheet.

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## CPC

CPC of Army material is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent future problems.

Corrosion specifically occurs with metals. It is an electrochemical process that causes the degradation of metals. It is commonly caused by exposure to moisture, acids, bases, or salts. An example is the rusting of iron. Corrosion damage in metals can be seen, depending on the metal, as tarnishing, pitting, fogging, surface residue, and/or cracking.

Plastics, composites, and rubbers can also degrade. Degradation is caused by thermal (heat), oxidation (oxygen), solvation (solvents), or photolytic (light, typically Ultraviolet (UV)) processes. The most common exposures are excessive heat or light. Damage from these processes will appear as cracking, softening, swelling, and/or breaking. SF 368, Product Quality Deficiency Report, should be submitted to the address specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

For aircraft TMs, this information shall include a reference to TM 1-1500-344-23, volumes 1 through 4 (Cleaning and Corrosion Control).

## Rust Definition

Rust is defined as any various scaly or powdery reddish-brown or reddish-yellow materials that form on iron and iron-coated materials in the presence of moisture, deteriorating as a result of disuse or neglect.

## Deterioration Definition

Deterioration is defined as any condition that causes material to be defective or lessens the quality or value of the material.

## Cracking Definition

Cracking is defined as when material is found to be split or broken, either completely or partially.

## INSPECTION

Look for signs of problems or troubles. Most problems can be detected by sight, touch, smell, or sound. Be alert when around the AMMPS generator set.

Inspect to ensure that all components are in good condition. Are they correctly assembled, stowed, or secured? Are any components worn, corroded, or rusty? Correct any problems found or notify your immediate supervisor.

There are common items that should be checked. These include the following:

**Bolts, clamps, screws, and nuts:** Continuously inspect for looseness. Inspect for chipped paint, bare metal, rust, or corrosion around bolt and screw heads and nuts. Replace as necessary. Tighten hardware as required.

**Welds:** Some components of the AMMPS generator set are welded. To inspect welds, look for chipped paint, rust, corrosion, or gaps. When these conditions are found, repair or replace as required.

## WARNING

- NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.
- Metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry and do not wear loose clothing when working on equipment. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator set is operating. Failure to comply may cause injury or death to personnel.

**Electrical wires, connectors, and harnesses:** Tighten loose connections. Inspect for cracked or broken insulation, bare wires, and broken connectors. If any are found, repair or replace as required.

**Hoses and fluid lines:** Inspect for wear, damage, and leaks. Ensure clamps and fittings are tight. Wet spots indicate a leak. A stain by a fitting or connector can also mean a leak. When this is found, repair or replace as required.

## CLEANING AND LUBRICATION

Proper cleaning and lubrication can aid in avoiding possible problems or trouble. Make it a habit to do the following:

## CAUTION

Follow all cleaning and lubrication instructions carefully. Failure to comply may cause damage to equipment.

Under harsh environmental conditions, conduct PMCS more frequently.

Use only the recommended cleaning solutions and lubricants listed in WP 0180, Expendable and Durable Items List.

Clean the lenses and screens of the DCS using the electronics cleaning cloth listed in WP 0180, Expendable and Durable Items List.

### Oil Filters

Oil filters shall be serviced/cleaned/changed, as applicable, when:

- They are known to be contaminated or clogged,
- Service is recommended by AOAP laboratory analysis, or
- At prescribed hardtime intervals.

### AOAP Sampling Intervals

Engine oil/transmission oil/hydraulic fluids must be sampled at 60 days (Active Army and Reserve NG) as prescribed by DA PAM 750-8, TAMMS Users Manual.

**Warranty Hardtime**

For equipment under manufacturer's warranty, hardtime oil service intervals shall be followed. Intervals shall be shortened if lubricants are known to be contaminated or if operation is under adverse conditions (such as longer-than-usual operating hours, extended idling periods, extreme dust).

**FLUID LEAKAGE****WARNING**

- Do not operate generator set if fuel leaks are present. Fuel is combustible. Always perform PMCS before operation. Failure to comply may cause injury or death to personnel.
- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

**CAUTION**

When operating with Class I or II leaks, continue to check fluid level as required by PMCS. Class III leaks should be noted and repaired immediately. Any Class I, II, or III fuel leak requires equipment shut down. Failure to comply may cause damage to equipment.

It is necessary to know how fluid leakage affects the status of the 30 kW generator sets. Following are types/classes of leakage you need to know to determine the status of the 30 kW generator sets. Learn these leakage definitions, and remember—when in doubt, notify your supervisor. Equipment operation is allowed with minor leakage (Class I or II). Consideration must be given to fluid capacity in the item/system being checked/inspected. When in doubt, notify your supervisor.

Any Class I, II, or III fuel leak requires equipment shut down.

Class III leaks should be reported immediately to your supervisor.

- (1) Class I: Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.
- (2) Class II: Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected.
- (3) Class III: Leakage of fluid great enough to form drops that fall from item being checked/inspected.

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**FIELD PMCS**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Belt, V-drive (5/8 inch x 52 inch) (WP 0147, Repair Parts List, Figure 42, Item 11)

Element, air filter (WP 0113, Repair Parts List, Figure 8, Item 8)

Element, coalescer (WP 0139, Repair Parts List, Figure 34, Item 26)

Element, fuel filter (WP 0144, Repair Parts List, Figure 39, Item 5)

Element, lubricating oil filter (WP 0136, Repair Parts List, Figure 31, Item 12)

Filter, fuel (WP 0118, Repair Parts List, Figure 13, Item 7)

Antifreeze, ethylene glycol (WP 0180, Expendable and Durable Items List, Item 2)

Brush, wire, scratch, brass (WP 0180, Item 7)

Cap set, protective (WP 0180, Item 8)

Cleaning compound, engine cooling system (WP 0180, Item 10)

Cleaning compound, solvent (WP 0180, Item 11)

Cloth, cleaning, electronics (WP 0180, Item 13)

Distilled water (WP 0180, Item 19)

Fuel, diesel (WP 0180, Item 21)

Grease, electrically conductive (WP 0180, Item 22)

Lubricating oil, engine (WP 0180, Item 25)

Pan, drain (WP 0180, Item 30)

Penetrating oil (WP 0180, Item 31)

Rag, wiping (WP 0180, Item 33)

Sealant (WP 0180, Item 34)

**Personnel Required**

91D (1)

**References**

WP 0018, Repair DCS

WP 0020, Service Air Cleaner

WP 0021, Remove/Install Charge Air Cooler

WP 0022, Service Cooling System

WP 0026, Remove/Install Winterization Kit Components

WP 0038, Remove/Install Relay Panel

WP 0044, Service Fuel System

WP 0048, Remove/Install Fuel Filter/Water Separator Element

WP 0050, Remove/Install Fuel Cooler

WP 0068, Service Lubrication System

WP 0070, Remove/Install Coalescer

WP 0072, Remove/Install Spin-on Fuel Filter Assembly

WP 0074, Test/Replace Fuel Injectors

WP 0080, Remove/Install Battery-Charging Alternator Belt

WP 0085, Remove/Install Turbocharger

WP 0089, Remove/Install Valve Cover

WP 0090, Check/Adjust Valves

WP 0094, Lubrication Instructions

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Table 1. Preventive Maintenance Checks and Services.

ITEM NUMBER	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF
<p style="text-align: center;"><b>WARNING</b></p> <ul style="list-style-type: none"> <li>• Operation and maintenance of the AMMPS generator sets contains many possibilities for injury or death to personnel. Be sure to be familiar with general first aid procedures as referenced in FM 4-25.11, First Aid. Failure to comply may cause injury or death to personnel.</li> <li>• Metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry and do not wear loose clothing when working on equipment. Failure to comply may cause injury or death to personnel.</li> <li>• While inspecting the operation of the generator set, do not inadvertently reach into the generator set. Failure to comply may cause injury or death to personnel.</li> <li>• Flying debris or material may enter eyes or strike the face. Wear appropriate eye/face protection while performing maintenance tasks. Failure to comply may cause injury or death to personnel.</li> <li>• Never inject fuel near a fire source. Atomized fuel is highly combustible. Fuel pressure is high enough to penetrate skin. Ensure that spray from the injector nozzle is directed away from all personnel. Direct contact with spray can cause skin cell destruction and blood poisoning. Skin and eye protection are required when working in contact with fuel. Failure to comply may cause injury or death to personnel and damage to equipment.</li> <li>• Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.</li> <li>• Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (fuel fill static grounding). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate ESD. Fire and possible explosion can result. Failure to comply may cause injury or death to personnel.</li> <li>• Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Failure to comply may cause injury or death to personnel.</li> </ul>				

Table 1. Preventive Maintenance Checks and Services — Continued.

ITEM NUMBER	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF
<p style="text-align: center;"><b>WARNING</b></p> <ul style="list-style-type: none"> <li>Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.</li> <li>When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.</li> <li>NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.</li> <li>Battery acid can cause burns to skin and cause eye injury. Wear safety goggles and chemical gloves and avoid acid splash while working on the batteries. Failure to comply may cause injury or death to personnel.</li> <li>Batteries give off combustible gas. Do not smoke or use open flame when performing maintenance. Failure to comply may cause injury or death to personnel and damage to equipment.</li> <li>Hearing protection requested during maintenance or repair with engine running. Failure to comply can cause hearing loss.</li> <li>High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator set is running. Failure to comply may cause injury or death to personnel.</li> <li>High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.</li> <li>Do not operate generator set if any fuel leaks are present. Fuel is combustible. Always perform PMCS before operation. Failure to comply may cause injury or death to personnel.</li> <li>Make sure engine control switch is only set to PRIME &amp; RUN during fuel system checks. Failure to comply may cause injury or death to personnel.</li> </ul>				

Table 1. Preventive Maintenance Checks and Services — Continued.

ITEM NUMBER	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF
<p style="text-align: center;"><b>WARNING</b></p> <ul style="list-style-type: none"> <li>Ensure the frequency of any device powered by the GFCI convenience receptacle matches the frequency of the generator set. Failure to comply may cause injury or death to personnel.</li> </ul> <p style="text-align: center;"><b>CAUTION</b></p> <p>Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.</p> <p>Be sure to close radiator cap securely to avoid coolant leakage. Engine may overheat if cap is loose. Failure to comply may cause damage to equipment</p> <p style="text-align: center;"><b>NOTE</b></p> <p>Ensure operator level PMCS (TM 9-6115-752-10) has been performed before performing field maintenance level PMCS.</p>				
1	50 hr	Engine oil and filter	Perform first engine oil and filter change (WP 0068, Service Lubrication System).	
2	250 hr	DCS	1. Ensure BATTLESORT switch works, engine control switch operates as required, and EMERGENCY STOP push button pushes in and out (TM 9-6115-752-10). Repair or replace as required (WP 0018, Repair DCS).	Indicators are not working properly, switches fail to operate, or emergency stop does not work.
			2. Ensure screen is clean of dirt and excess debris by using an electronic cleaning cloth. Ensure screen is not damaged or scratched.	Screen is damaged or scratched.
3	250 hr	Relay panel	Check circuit breakers/relays for proper operation and reset or replace as required (WP 0038, Remove/Install Relay Panel).	Circuit breaker or relay missing or blown.
4	250 hr or 3 months	GFCI receptacle	Ensure TEST and RESET functions on GFCI receptacle operate properly (TM 9-6115-752-10).	GFCI TEST or RESET function does not operate properly.
5	250 hr or 3 months	Charge air cooler	Inspect charge air cooler and clean exterior surfaces as required. Replace as required (WP 0021, Remove/Install Charge Air Cooler).	Airflow through charge air cooler restricted, exterior surface clogged with dirt.



Table 1. Preventive Maintenance Checks and Services — Continued.

ITEM NUMBER	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF
6	250 hr or 3 months	Fuel Cooler	Inspect fuel cooler fins and connections for leaks or damage and replace or repair as required (WP 0050, Remove/Install Fuel Cooler).	Fuel cooler is leaking or is damaged.
7	250 hr	Crankcase breather	Inspect breather tube for damage or clogging. Clean or replace as necessary (WP 0089, Remove/Install Valve Cover).	Crankcase breather tube is clogged.
<p style="text-align: center;"><b>WARNING</b></p> <p>Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Failure to comply may cause injury or death to personnel.</p> <p style="text-align: center;"><b>CAUTION</b></p> <p>Be sure to close radiator cap securely to avoid coolant leakage. Engine may overheat if cap is loose. Failure to comply may cause damage to equipment.</p>				
8	250 hr or 3 months	Radiator	Clean water jacket and radiator exterior.	Airflow through radiator is restricted.
<p style="text-align: center;"><b>WARNING</b></p> <p>Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Failure to comply may cause injury or death to personnel.</p> <p style="text-align: center;"><b>CAUTION</b></p> <p>Be sure to close radiator cap securely to avoid coolant leakage. Engine may overheat if cap is loose. Failure to comply may cause damage to equipment.</p>				
9	500 hr or 6 months	Radiator cap	1. Inspect radiator cap for corrosion, torn or deteriorated seal, and obvious damage.	Radiator cap is damaged.
			2. Test radiator cap for proper operation (0022, Service Cooling System).	Radiator cap fails to open at proper pressure.
10	750 hr	Spin-on fuel filter	Replace spin-on fuel filter element (WP 0072, Remove/Install Spin-on Fuel Filter Assembly).	

Table 1. Preventive Maintenance Checks and Services — Continued.

ITEM NUMBER	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF
11	750 hr or 6 months	Fuel system	1. Clean main/auxiliary fuel strainers (WP 0044, Service Fuel System). Replace as required.	
			2. Drain 1 quart (qt) of fuel from fuel tank to remove sediment (WP 0044, Service Fuel System).	
12	750 hr or 6 months	Fuel filter/water separator	Replace the fuel filter/water separator element (WP 0048, Replace Fuel Filter/Water Separator Element).	Filter/water separator element is restricted.
13	750 hr or 6 months	Engine oil and filter	Change engine oil and oil filter (WP 0068, Service Lubrication System).	
14	750 hr or 6 months	Air filter element	Replace air filter element (WP 0020, Service Air Cleaner).	Air filter element is restricted.
<p style="text-align: center;"><b>WARNING</b></p> <p>A turbocharger may become very hot and requires more time to cool down than other parts of engine assembly. Shut down generator set and allow it to cool sufficiently before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.</p>				
15	1000 hr	Turbocharger	Inspect turbocharger for damage (WP 0085, Remove/Install Turbocharger).	Turbocharger is damaged.
16	1500 hr	Alternator belt	Replace battery-charging alternator belt and inspect belt tensioner for proper operation (WP 0080, Remove/Install Battery-Charging Alternator Belt).	Battery-charging alternator belt is loose, damaged or missing. Belt tensioner is loose or functioning improperly.
17	1 year	Winterization kit (if applicable)	Test winterization kit and inspect for damage (WP 0026, Remove/Install Winterization Kit Components).	Winterization kit test fails or damage is found during inspection.
18	2000 hr or 2 years	Cooling system	Drain, flush, and refill cooling system with new coolant (WP 0022, Service Cooling System).	
19	2000 hr or 2 years	Engine valves	Inspect and adjust engine valves (WP 0090, Check/Adjust Valves).	
20	5000 hr or 4 years	Breather filter coalescer	Replace filter of breather filter coalescer (WP 0070, Remove/Install Coalescer).	

Table 2. PMCS Mandatory Replacement Parts List.

ITEM NO.	PART NUMBER (CAGE C)	NSN	NOMENCLATURE	QTY
<b>750 HR OR 6 MONTHS</b>				
1	4942437 (0B8S3)		Element, fuel filter, spin-on	01
2	C6002112110 (0B8S3)	2940015098381	Element, lubricating, oil filter	01
3	R25T (55752)		Filter, fuel, fuel filter/water separator	01
4	AF26117 (33457)		Element, air filter	01
<b>1500 HR</b>				
1	BX509013-2050 (47WU2)		Belt, V-drive, battery-charging alternator	01
<b>5000 HR OR 4 YEARS</b>				
1	CV5060700 (4NUM0)		Element, coalescer	01

**LUBRICATION INSTRUCTIONS**

There are no scheduled lubrication intervals for external components (i.e. hinges and latches). Lubrication instructions are contained in WP 0094, Lubrication Instructions.

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL DCS**

---

**INITIAL SETUP:**

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Control box assembly (WP 0110, Repair Parts List, Figure 5, Item 3)

Washer, lock (WP 0110, Figure 5, Item 2)

Grease, electrically conductive (WP 0180, Expendable and Durable Items List, Item 22)

**Personnel Required**

91D

**References**

WP 0031, Remove/Install Rear Body Panel

WP 0035, Remove/Install Door

WP 00100, General Maintenance

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

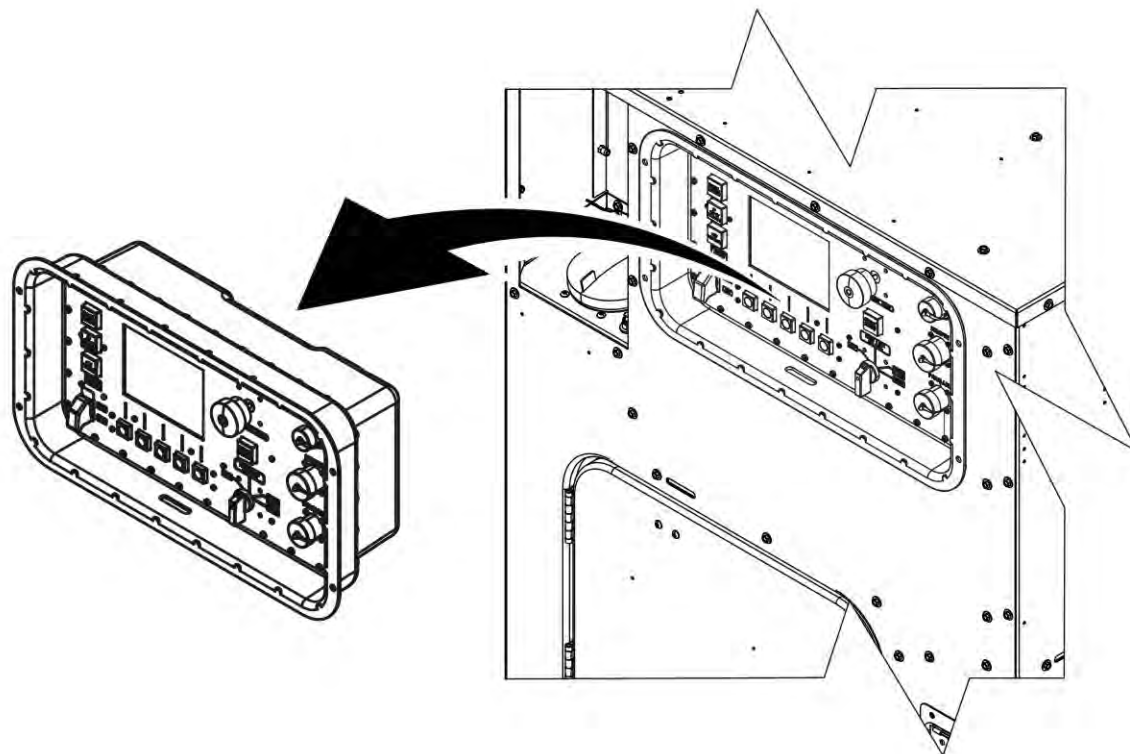
Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

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**REMOVE/INSTALL DCS****Remove DCS****NOTE**

The DCS has a cover that can be closed over the panel. To improve clarity, illustrations in this document show the DCS unit without the cover.



**Figure 1. DCS — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate DCS (Figure 1).

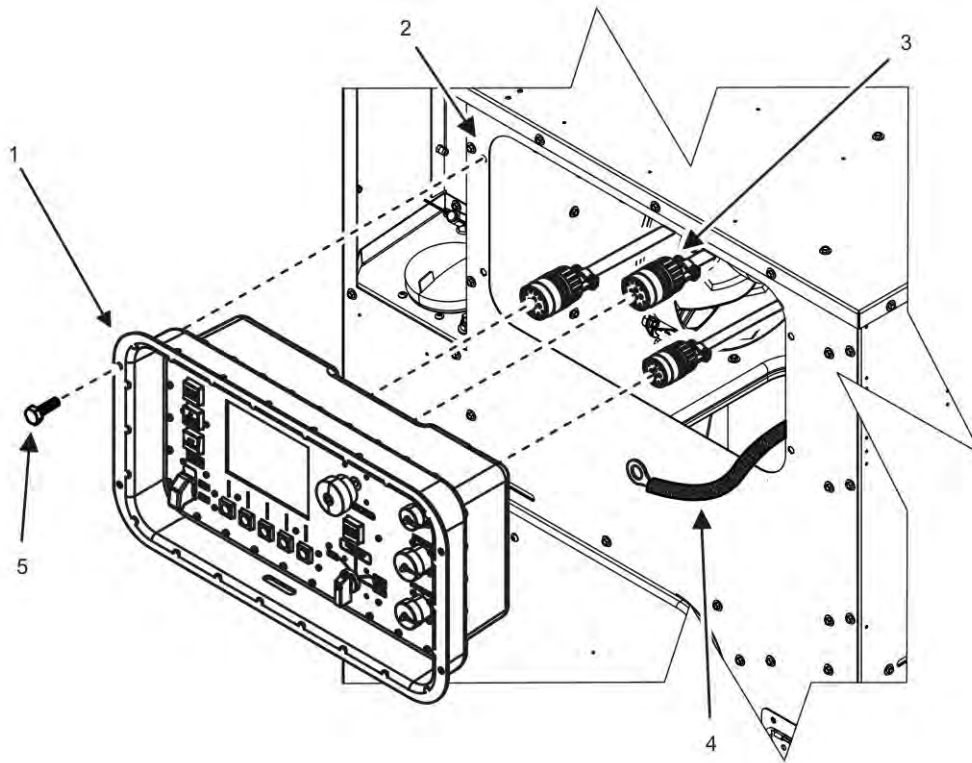


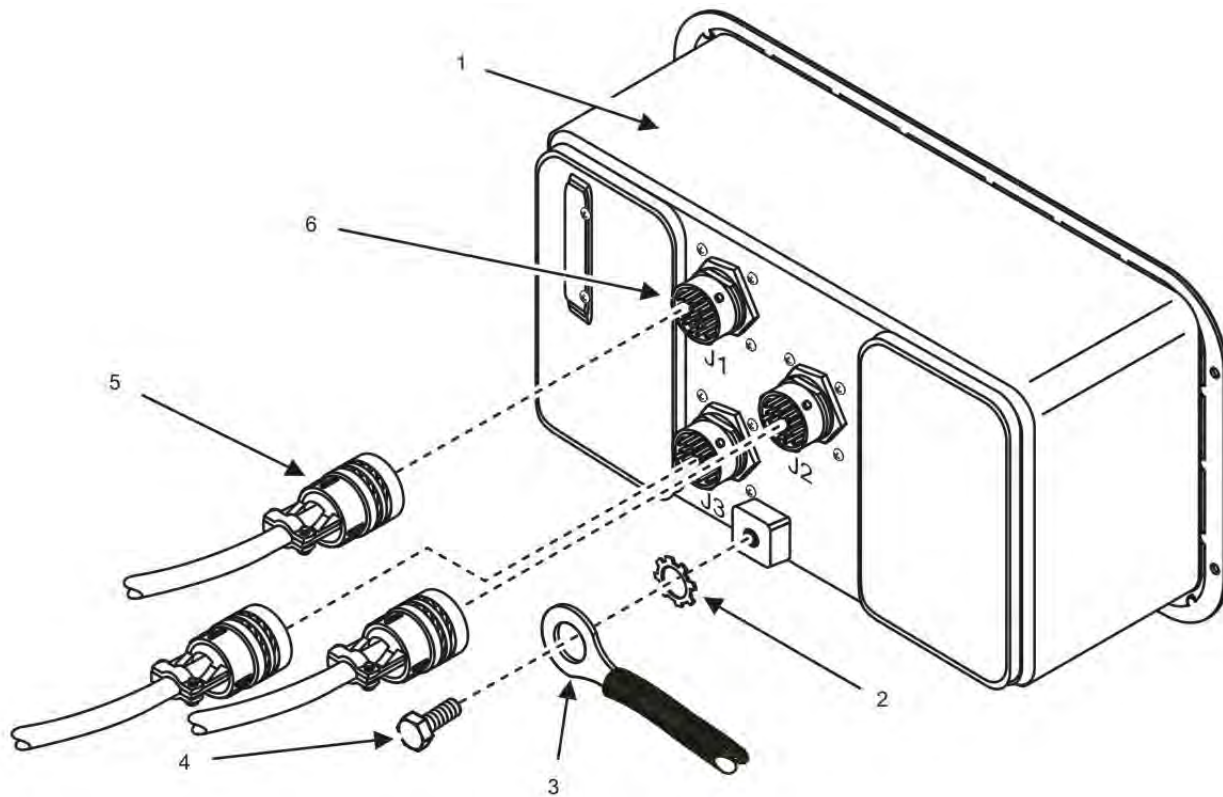
Figure 2. DCS Detail — Front.

### CAUTION

It is important to save capture file data from DCS being replaced (WP 0100, General Maintenance). Data can only be accessed using InPower AMMPS and a MSD hard drive (or compatible computer). If data is accessible, capture file can be used to overlay parameters and maintenance timers from the replaced DCS. If unable to access capture file data, maintenance timers will be reset and some parameters from replaced DCS will be lost. Use latest hard copy records to determine when maintenance actions are due. Failure to comply will cause damage to equipment.

It is important to save log data from DCS being replaced (WP 0100, General Maintenance). The maintenance, operational, and fault logs should be downloaded from the DCS and saved to the hard drive of a MSD (or compatible computer). Maintenance, operational, and fault logs cannot be uploaded to the new DCS, but can be saved for reference. All logs will be started over with a new DCS. If unable to access logs, use latest hard copy records to access operational, maintenance, and fault events. Failure to comply may cause damage to equipment.

3. Remove four hex socket head screws (Figure 2, Item 5) securing DCS unit (Figure 2, Item 1) to rear body panel (Figure 2, Item 2) and save screws for reuse.
4. Remove DCS unit (Figure 2, Item 1) from rear body panel (Figure 2, Item 2) to expose grounding strap (Figure 2, Item 4) attached to rear of DCS unit (Figure 2, Item 1).
5. Tag and remove three electrical connectors (Figure 2, Item 3) in rear of DCS unit (Figure 2, Item 1).
6. Remove bolt (Figure 3, Item 4) and lock washer (Figure 3, Item 2) securing grounding strap (Figure 3, Item 3) to rear of DCS unit (Figure 3, Item 1).



**Figure 3. DCS Detail — Rear.**

7. Discard lock washer (Figure 3, Item 2) and set bolt (Figure 3, Item 4) aside for reuse.
8. Place DCS unit (Figure 3, Item 1) on a suitable work surface.

#### **END OF TASK**

#### **Inspect DCS**

1. Inspect DCS door (not shown) and door hinge (not shown) for corrosion or damage, and replace as required (WP 0035, Remove/Install Door).
2. Inspect DCS unit (Figure 3, Item 1) for corrosion or damage, and replace as required.
3. Inspect DCS front panel for broken switches or other damage, and replace as required.
4. Inspect electrical connections (Figure 3, Item 6) in rear of DCS unit and in wiring harness (Figure 3, Item 5) for corrosion or other damage and replace unit if damage is found.
5. Inspect all mounting hardware for damage, and replace as required.
6. Inspect DCS mounting area on unit rear body panel (Figure 2, Item 2) for damage or corrosion, and replace panel as required (WP 0031, Remove/Install Rear Body Panel).

#### **END OF TASK**

#### **Install DCS**

1. Position DCS unit (Figure 2, Item 1) on rear body panel (Figure 2, Item 2).



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**NOTE**

Prior to installation, apply electrically conductive grease to the electrical connectors (Figure 2, Item 3) to prevent moisture from entering the connectors.

2. Attach DCS grounding strap (Figure 3, Item 3) to rear of DCS unit (Figure 3, Item 1) using bolt (Figure 3, Item 4) and new lock washer (Figure 3, Item 2).
3. Install DCS electrical connectors (Figure 2, Item 3) to back of DCS unit.
4. Remove identification tags from DCS electrical connectors (Figure 2, Item 3).
5. Install four hex socket head screws (Figure 2, Item 5) securing DCS unit (Figure 2, Item 1) to rear body panel (Figure 2, Item 2).
6. Install negative ground cable to right-hand battery (0037, Remove/Install Batteries).
7. Close left-side door on generator set.
8. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
9. Start engine (TM 9-6115-752-10).
10. Test control panel for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
11. Repair as required.

**END OF TASK****Adjust Governor Gain****NOTE**

[Governor Gain] for 60 Hz and 40.0 Hz has a default of 1 and a range of 0.8 Hz to 1.0 Hz. [Governor Gain] for 50 Hz has a default of 1 and a range of 0.5 Hz to 1.0 Hz. Adjusting to higher value increases output at higher ambient temperatures, but also increases instability and can cause hunting problems. A lower value decreases output at lower ambient temperatures, which can help with stability and hunting problems, but also decreases performance.

1. Ensure battery ground cable is installed (WP 0037, Remove/Install Batteries).
2. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
3. Reset [Governor Gain] option on [Adjustments] Screen 2 to default (TM 9-6115-752-10).
4. Start generator set (TM 9-6115-752-10).
5. Apply and remove load up to rated capacity. Observe frequency fluctuations.
6. Proceed to step 7 if frequency fluctuations are observed.
7. Access [Governor Gain] option from [Adjustments] Screen 2 (TM 9-6115-752-10).
8. Adjust [Governor Gain] down or up 0.1 Hz at a time until output, stability, or hunting problem is resolved.
9. Observe frequency fluctuations and continue to adjust [Governor Gain] by applying and removing loads until output, stability, or hunting problem is resolved.

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REPAIR DCS**

---

**INITIAL SETUP:**

**Test Equipment**

Load Bank (WP 0179, Table 2, Item 2)

**Tools and Special Tools**

Strap, Wrist, Electrostatic Discharge (WP 0179, Table 2, Item 23)

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Gasket, control box (WP 0110, Repair Parts List, Figure 5, Item 5)

Ring, sealing (WP 0111, Repair Parts List, Figure 6, Item 16)

Switch, battleshort (WP 0111, Figure 6, Item 15)

Switch, emergency stop (WP 0111, Figure 6, Item 4)

Switch, engine control (WP 0111, Figure 6, Item 5)

Washer, lock (WP 0110, Figure 5, Item 2)

Pad, scouring (WP 0180, Expendable and Durable Items List, Item 29)

Strap, tie-down (WP 0180, Item 36)

**Personnel Required**

91D (1)

Assistant (1)

**References**

WP 0009, Electrical System Troubleshooting without a DCS Code

WP 0017, Remove/Install DCS

WP 0037, Remove/Install Batteries

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

**Special Environmental Conditions**

Dry area with minimal dust

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**REPAIR DCS ASSEMBLY**

**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

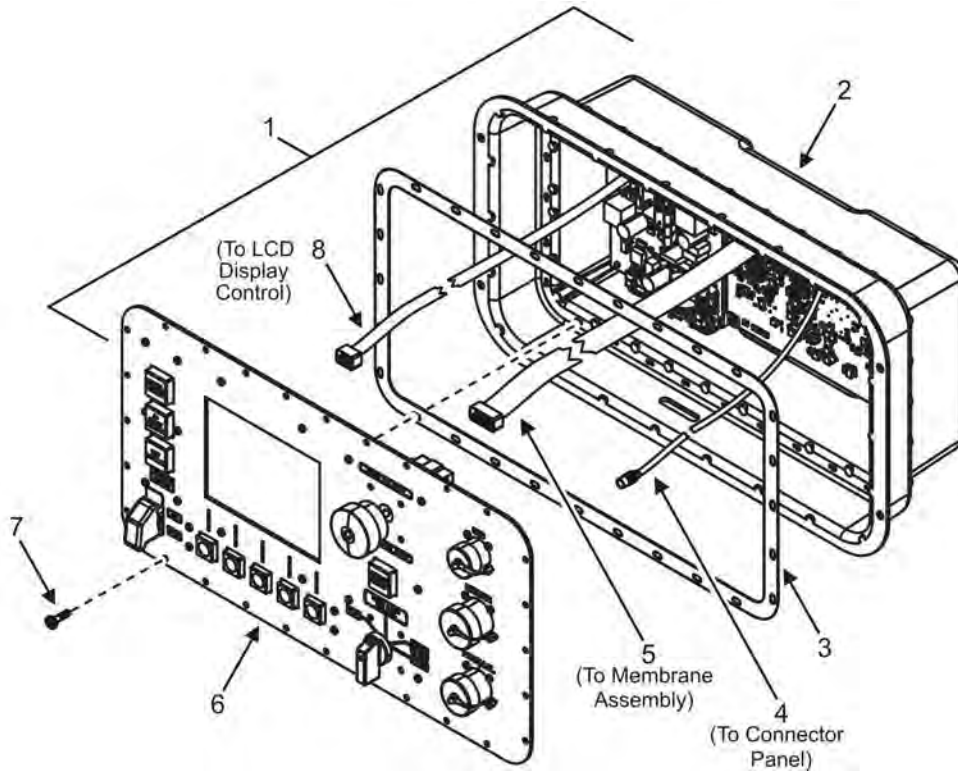
**CAUTION**

Due to the use of delicate electronic components, repair of DCS must be performed in a clean environment. Failure to comply may cause damage to equipment.

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

**NOTE**

Repair of the DCS at field level is limited to replacement of the BATTLESHORT switch, EMERGENCY STOP switch, and engine control switch. Failure of any other component inside the DCS requires DCS replacement (WP 0017, Remove/Install DCS).

**Remove DCS Control Panel Assembly**

**Figure 1. DCS Control Panel and Enclosure.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove negative ground cable from right-hand battery (WP 0037, Remove/Install Batteries).
3. Open DCS door and secure in the open position.
4. Remove 28 screws (Figure 1, Item 7) that secure DCS control panel (Figure 1, Item 6) to DCS enclosure (Figure 1, Item 2).
5. Break seal between DCS control panel (Figure 1, Item 6) and DCS enclosure (Figure 1, Item 2) using a putty knife.
6. Lift DCS control panel (Figure 1, Item 6) from DCS enclosure (Figure 1, Item 2) high enough to access three wiring harnesses (Figure 1, Items 4, 5, and 8) that connect DCS control panel (Figure 1, Item 6) to DCS enclosure (Figure 1, Item 2).

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## CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

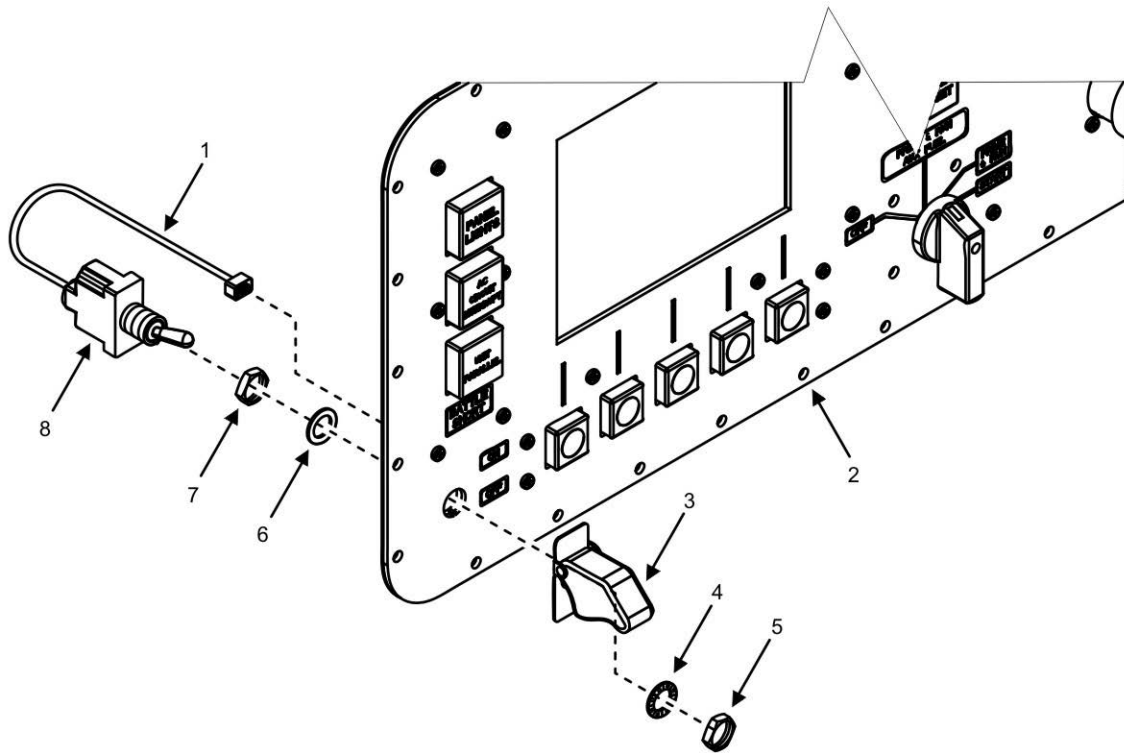
## NOTE

Prior to removal, tag all electrical wires, cables, and leads for identification. Tags will be used as a guide during installation.

7. Tag and remove three wiring harnesses (Figure 1, Items 4, 5, and 8) that connect DCS control panel (Figure 1, Item 6) to DCS enclosure (Figure 1, Item 2).
8. Unhook clips on wiring harnesses and remove harnesses from DCS control panel (Figure 1, Item 6).
  - a. Tag and remove six-pin wiring harness (Figure 1, Item 4) connected to connector panel control card (not shown) of DCS control panel (Figure 1, Item 6).
  - b. Tag and remove 14-pin wiring harness (Figure 1, Item 8) connected to display control card (not shown) of DCS control panel (Figure 1, Item 6).
  - c. Tag and remove 22-pin wiring harness (Figure 1, Item 5) connected to membrane panel assembly (not shown) of DCS control panel (Figure 1, Item 6).
9. Remove DCS control panel (Figure 1, Item 6) from DCS enclosure (Figure 1, Item 2) and place on a suitable work surface.
10. Remove and discard gasket (Figure 1, Item 3) from DCS control panel (Figure 1, Item 6).
11. Remove residual gasket material from DCS control panel (Figure 1, Item 6) and DCS enclosure (Figure 1, Item 2) using an abrasive pad. Be sure to remove all loose gasket material from components.

## END OF TASK

## Test/Replace Switches



**Figure 2. BATTLESHORT Switch.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove DCS control panel assembly and place on a suitable work surface. See Remove DCS Control Panel Assembly task.
3. Test BATTLESHORT switch (Figure 2, Item 8):
  - a. Remove wiring harness (Figure 2, Item 1) from membrane panel assembly (not shown).

### NOTE

Continuity should be present when BATTLESHORT switch (Figure 2, Item 8) is in ON position. There should be no continuity when BATTLESHORT switch (Figure 2, Item 8) is in OFF position.

- b. Place BATTLESHORT switch (Figure 2, Item 8) in ON position, and test wires P1 (P1/SW-3) and P3 (P3/SW-2) through wiring harness (Figure 2, Item 1) using a multimeter set to test continuity.
- c. Proceed to step d if no continuity is found or step f if continuity is found.
- d. Leave BATTLESHORT switch (Figure 2, Item 8) in ON position and test two terminals on bottom of BATTLESHORT switch (Figure 2, Item 8) using a multimeter set to test continuity.
- e. Repair or replace wiring harness (Figure 2, Item 1) if continuity is found, or replace BATTLESHORT switch (Figure 2, Item 8) if no continuity is found (step 4). Retest IAW step b and repair or replace wiring harness (Figure 2, Item 1) as required.
- f. Place BATTLESHORT switch (Figure 2, Item 8) in OFF position, and test wires P1 (P1/SW-3) and P3 (P3/SW-2) through wiring harness (Figure 2, Item 1) using a multimeter set to test continuity.
- g. Proceed to step j if no continuity is found or step h if continuity is found.

- h. Leave BATTLESHORT switch (Figure 2, Item 8) in OFF position, and test two terminals on bottom of BATTLESHORT switch (Figure 2, Item 8) using a multimeter set to test continuity.
  - i. Repair or replace wiring harness (Figure 2, Item 1) if continuity is found or replace BATTLESHORT switch (Figure 2, Item 8) if no continuity is found (step 4). Retest IAW step f and repair or replace wiring harness (Figure 2, Item 1) as required.
  - j. Install wiring harness (Figure 2, Item 1) to membrane panel assembly (not shown).
4. Remove BATTLESHORT switch (Figure 2, Item 8):

### CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

### NOTE

Prior to removal, tag all electrical wires, cables, and leads for identification. Tags will be used as a guide during installation.

- a. Tag wiring harness (Figure 2, Item 1) from BATTLESHORT switch (Figure 2, Item 8) to membrane panel assembly (not shown) of DCS control panel (Figure 2, Item 2).
  - b. Unhook clip on wiring harness (Figure 2, Item 1) and remove wiring harness (Figure 2, Item 1) from membrane panel assembly (not shown).
  - c. Move BATTLESHORT switch cover (Figure 2, Item 3) on BATTLESHORT switch (Figure 2, Item 8) to open position.
  - d. Remove nut (Figure 2, Item 5) and internal tooth lock washer (Figure 2, Item 4) which secures BATTLESHORT switch (Figure 2, Item 8) to front of DCS control panel (Figure 2, Item 2).
  - e. Discard internal tooth lock washer (Figure 2, Item 4) and sealing ring (Figure 2, Item 6).
  - f. Remove BATTLESHORT switch (Figure 2, Item 8) and BATTLESHORT switch cover (Figure 2, Item 3) from DCS control panel (Figure 2, Item 2).
  - g. Remove nut (Figure 2, Item 7) from BATTLESHORT switch (Figure 2, Item 8).
  - h. Inspect BATTLESHORT switch (Figure 2, Item 8) for signs of obvious damage. Replace as required.
5. Install BATTLESHORT switch (Figure 2, Item 8):
- a. Align tab on DCS control panel (Figure 2, Item 2) to slot in BATTLESHORT switch (Figure 2, Item 8).
  - b. Position BATTLESHORT switch (Figure 2, Item 8), nut (Figure 2, Item 7), and new sealing ring (Figure 2, Item 6) to mounting location on rear of DCS control panel (Figure 2 Item 2), engaging alignment tab on DCS control panel (Figure 2, Item 2) to slot in BATTLESHORT switch (Figure 2, Item 8).
  - c. Secure BATTLESHORT switch (Figure 2, Item 8) to DCS control panel (Figure 2, Item 2) by installing BATTLESHORT switch cover (Figure 2, Item 3), new internal tooth lock washer (Figure 2, Item 4), and nut (Figure 2, Item 5) to BATTLESHORT switch (Figure 2, Item 8).

## CAUTION

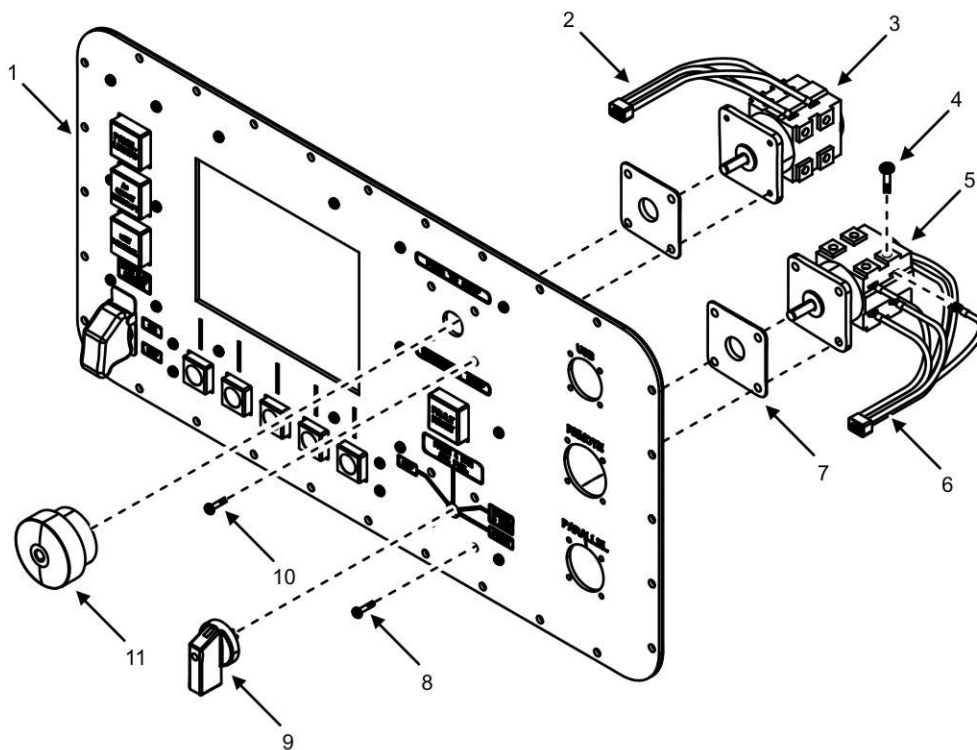
Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

Ensure hooks on all wiring harnesses are latched properly after installation. Failure to comply may cause damage to equipment.

## NOTE

Identification tags should remain in place until the DCS is completely reassembled and has been tested for proper operation.

- d. Install electrical connector on BATTLESHORT switch (Figure 2, Item 8) to corresponding connector on membrane panel control card (not shown).



**Figure 3. EMERGENCY STOP and Engine Control Switches.**

6. Test EMERGENCY STOP switch (Figure 3, Item 3):
  - a. Remove wiring harness (Figure 3, Item 2) from membrane panel assembly (not shown).



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**NOTE**

Continuity should be present when EMERGENCY STOP switch (Figure 3, Item 3) is in extended (OFF) position. There should be no continuity when EMERGENCY STOP switch (Figure 3, Item 3) is in PUSH TO STOP (ON) position.

- b. Pull EMERGENCY STOP switch (Figure 3, Item 3) to extended position (OFF) and test wires to terminals 5 and 6 (P205-1/S202-5 and P205-2/S202-6) through wiring harness (Figure 3, Item 2) using a multimeter set to test continuity.
  - c. Proceed to step d if no continuity is found or step f if continuity is found.
  - d. Leave EMERGENCY STOP switch (Figure 3, Item 3) in extended position (OFF) and test terminals 5 and 6 on EMERGENCY STOP switch (Figure 3, Item 3) using a multimeter set to test continuity.
  - e. Repair or replace wiring harness (Figure 3, Item 2) if continuity is found, or replace EMERGENCY STOP switch (Figure 3, Item 3) if no continuity is found (step 7). Retest IAW step b and repair or replace wiring harness (Figure 3, Item 2) as required.
  - f. Repeat steps a through e for wires to terminals 7 and 8 (P205-4/S202-7 and P205-5/S202-8) and EMERGENCY STOP switch (Figure 3, Item 3) terminals 7 and 8.
  - g. Push EMERGENCY STOP switch (Figure 3, Item 3) to PUSH TO STOP position (ON), and test wires to terminals 5 and 6 (P205-1/S202-5 and P205-2/S202-6) through wiring harness (Figure 3, Item 2) using a multimeter set to test continuity.
  - h. Proceed to step i if continuity is found or step k if no continuity is found.
  - i. Leave EMERGENCY STOP switch (Figure 3, Item 3) in PUSH TO STOP position (ON), and test terminals 5 and 6 on EMERGENCY STOP switch (Figure 3, Item 2) using a multimeter set to test continuity.
  - j. Repair or replace wiring harness (Figure 3, Item 2) if no continuity is found, or replace EMERGENCY STOP switch (Figure 3, Item 3) if continuity is found (step 7). Retest IAW step g and repair or replace wiring harness (Figure 3, Item 2) as required.
  - k. Repeat steps g through j for wires to terminals 7 and 8 (P205-4/S202-7 and P205-5/S202-8) and EMERGENCY STOP switch (Figure 3, Item 3) terminals 7 and 8.
  - l. Install wiring harness (Figure 3, Item 2) to membrane panel assembly (not shown).
7. Remove EMERGENCY STOP switch (Figure 3, Item 3):

**NOTE**

Sealing gasket, sealing screws, and handle for EMERGENCY STOP switch (Figure 3, Item 3) are available only with a new EMERGENCY STOP switch (Figure 3, Item 3).

- a. Loosen set screw (not shown) that secures handle (Figure 3, Item 11) to EMERGENCY STOP switch (Figure 3, Item 3) on front of DCS control panel (Figure 3, Item 1).
- b. Remove and discard handle (Figure 3, Item 11) from EMERGENCY STOP switch (Figure 3, Item 3).

## CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

## NOTE

Prior to removal, tag all electrical wires, cables, and leads for identification. Tags will be used as a guide during installation.

- c. Tag wiring harness (Figure 3, Item 2) from EMERGENCY STOP switch (Figure 3, Item 3) to membrane panel assembly (not shown) of DCS control panel (Figure 3, Item 1).
  - d. Unhook clip on wiring harness (Figure 3, Item 2) and remove wiring harness (Figure 3, Item 2) from membrane panel assembly (not shown).
  - e. Remove and discard four mounting screws (Figure 3, Item 10) that secure EMERGENCY STOP switch (Figure 3, Item 3) to front of DCS control panel (Figure 3, Item 1).
  - f. Remove and discard EMERGENCY STOP switch (Figure 3, Item 3) and gasket (Figure 3, Item 7) from rear of DCS control panel (Figure 3, Item 1).
  - g. Tag and remove four wires from EMERGENCY STOP switch (Figure 3, Item 3) by removing screws (Figure 3, Item 4).
8. Install EMERGENCY STOP switch (Figure 3, Item 3).

## NOTE

Identification tags should remain in place until the DCS is completely reassembled and has been tested for proper operation.

Apply a thin coat of electrically conductive grease to all electrical connections prior to assembly.

- a. Install four wires of wiring harness (Figure 3, Item 2) to contacts on EMERGENCY STOP switch (Figure 3, Item 3) using tags applied at removal as a guide.
- b. Position new gasket (Figure 3, Item 7) (supplied with new EMERGENCY STOP switch (Figure 3, Item 3) and new EMERGENCY STOP switch (Figure 3, Item 3) to mounting location on rear of DCS control panel (Figure 3, Item 1) and align the mounting holes.
- c. Secure EMERGENCY STOP switch (Figure 3, Item 3) to DCS control panel (Figure 3, Item 1) by installing four new mounting screws (Figure 3, Item 10) (supplied with new EMERGENCY STOP switch (Figure 3, Item 3) through front of DCS control panel (Figure 3, Item 1).

## CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

Ensure hooks on all wiring harnesses are latched properly after installation. Failure to comply may cause damage to equipment.

- d. Install connector of wiring harness (Figure 3, Item 2) to corresponding connector on membrane panel assembly (not shown).
- e. Install new handle (Figure 3, Item 11) (supplied with new EMERGENCY STOP switch (Figure 3, Item 3) to EMERGENCY STOP switch (Figure 3, Item 3) and tighten set screw to secure.

9. Test engine control switch (Figure 3, Item 5):
  - a. Remove wiring harness (Figure 3, Item 6) from membrane panel assembly (not shown).

### NOTE

Engine control switch will show continuity between SW COMMON (P206-6/S201-1) and one other wire for each corresponding position chosen. When holding between PRIME & RUN and START positions, continuity will be between PRIME/RUN SW (P206-3/S201-6) and ROTARY START SW (P206-4/S201-8).

- b. Turn engine control switch (Figure 3, Item 5) to OFF position, and test wires SW COMMON (P206-6/S201-1) and OFF SW (P206-1/S201-2) through wiring harness (Figure 3, Item 6) using a multimeter set to test continuity.
- c. Proceed to step f if continuity is found or step d if no continuity is found.
- d. Test terminals 1 and 2 on engine control switch (Figure 3, Item 5) using a multimeter set to test continuity.
- e. Repair or replace wiring harness (Figure 3, Item 6) if continuity is found, or replace engine control switch (Figure 3, Item 5) if no continuity is found (step 10). Retest IAW step b and repair or replace wiring harness (Figure 3, Item 6) as required.
- f. Turn engine control switch (Figure 3, Item 5) to PRIME & RUN AUX FUEL position, and test wires SW COMMON (P206-6/S201-1) and PRIME/AUX SW (P206-2/S201-4) through wiring harness (Figure 3, Item 6) using a multimeter set to test continuity.
- g. Proceed to step j if continuity is found or step h if no continuity is found.
- h. Test terminals 1 and 4 on engine control switch (Figure 3, Item 5) using a multimeter set to test continuity.
- i. Repair or replace wiring harness (Figure 3, Item 6) if continuity is found, or replace engine control switch (Figure 3, Item 5) if no continuity is found (step 10). Retest IAW step f and repair or replace wiring harness (Figure 3, Item 6) as required.
- j. Turn engine control switch (Figure 3, Item 5) to PRIME & RUN position, and test wires SW COMMON (P206-6/S201-1) and PRIME/RUN SW (P206-3/S201-6) through wiring harness (Figure 3, Item 6) using a multimeter set to test continuity.
- k. Proceed to step n if continuity is found or step l if no continuity is found.
- l. Test terminals 1 and 6 on engine control switch (Figure 3, Item 5) using a multimeter set to test continuity.
- m. Repair or replace wiring harness (Figure 3, Item 6) if continuity is found or replace engine control switch (Figure 3, Item 5) if no continuity is found (step 10). Retest IAW step j and repair or replace wiring harness (Figure 3, Item 6) as required.

### NOTE

Use of an assistant is required when holding engine control switch in START position to measure continuity. Engine control switch must be held in START position in order to obtain an accurate measurement.

- n. Hold engine control switch (Figure 3, Item 5) in START position, and test wires SW COMMON (P206-6/S201-1) and ROTARY START SW (P206-4/S201-8) through wiring harness (Figure 3, Item 6) using a multimeter set to test continuity.
- o. Proceed to step r if continuity is found or step p if no continuity is found.
- p. Test terminals 1 and 8 on engine control switch (Figure 3, Item 5) using a multimeter set to test continuity.
- q. Repair or replace wiring harness (Figure 3, Item 6) if continuity is found, or replace engine control switch (Figure 3, Item 5) if no continuity is found (step 10). Retest IAW step n and repair or replace wiring harness (Figure 3, Item 6) as required.

**NOTE**

When engine control switch (Figure 3, Item 5) is turned slowly from PRIME & RUN to START position, a momentary continuity reading should be obtained. Use of an assistant is required when moving engine control switch (Figure 3, Item 5) between PRIME & RUN and START positions to measure continuity. Engine control switch (Figure 3, Item 5) must be moved to position between PRIME & RUN and START in order to obtain accurate reading.

- r. Move engine control switch (Figure 3, Item 5) back and forth slowly from START to PRIME & RUN and from PRIME & RUN to START while testing wires PRIME/RUN SW (P206-3/S201-6) and ROTARY START SW (P206-4/S201-8) using a multimeter set to test continuity.
  - s. Proceed to step v if continuity is found or step t if no continuity is found.
  - t. Move engine control switch (Figure 3, Item 5) back and forth slowly from START to PRIME & RUN and from PRIME & RUN to START while testing terminals 6 and 8 on engine control switch (Figure 3, Item 5) using a multimeter set to test continuity.
  - u. Repair or replace wiring harness (Figure 3, Item 6) if continuity is found, or replace engine control switch (Figure 3, Item 5) if no continuity is found (step 10). Retest IAW step r and repair or replace wiring harness (Figure 3, Item 6) as required.
  - v. Install wiring harness (Figure 3, Item 6) to membrane panel assembly (not shown).
10. Remove engine control switch (Figure 3, Item 5):

**NOTE**

Sealing gasket, sealing screws, and handle for engine control switch are available only with a new engine control switch.

- a. Loosen set screw (not shown) that secures handle (Figure 3, Item 9) to engine control switch (Figure 3, Item 5) on front of DCS control panel (Figure 3, Item 1).
- b. Remove and discard handle (Figure 3, Item 9) from engine control switch (Figure 3, Item 5).

**CAUTION**

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

**NOTE**

Prior to removal, tag all electrical wires, cables, and leads for identification. Tags will be used as a guide during installation.

- c. Tag wiring harness (Figure 3, Item 6) from engine control switch (Figure 3, Item 5) to membrane panel assembly (not shown) of DCS control panel (Figure 3, Item 1).
- d. Unhook clip on wiring harness (Figure 3, Item 6) and remove wiring harness (Figure 3, Item 6) from membrane panel assembly (not shown).
- e. Remove and discard four mounting screws (Figure 3, Item 8) securing engine control switch (Figure 3, Item 5) to front of DCS control panel (Figure 3, Item 1).
- f. Remove and discard engine control switch (Figure 3, Item 5) and gasket (Figure 3, Item 7) from front of DCS control panel (Figure 3, Item 1).
- g. Tag and remove six wires from engine control switch (Figure 3, Item 5) by removing screws (Figure 3, Item 4).

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11. Install engine control switch (Figure 3, Item 5):

- a. Install six wires of wiring harness (Figure 3, Item 6) to contacts on engine control switch (Figure 3, Item 5) using tags applied at removal as a guide.
- b. Position new gasket (Figure 3, Item 7) (supplied with new engine control switch (Figure 3, Item 5) and new engine control switch (Figure 3, Item 5) to mounting location on rear of DCS control panel (Figure 3, Item 1) and align the mounting holes.
- c. Secure engine control switch (Figure 3, Item 5) to DCS control panel (Figure 3, Item 1) by installing four new mounting screws (Figure 3, Item 8) (supplied with new engine control switch (Figure 3, Item 5)) through front of DCS control panel (Figure 3, Item 1).

### CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

Ensure hooks on all wiring harnesses are latched properly after installation. Failure to comply may cause damage to equipment.

### NOTE

Identification tags should remain in place until the DCS is completely reassembled and has been tested for proper operation.

Apply a thin coat of electrically conductive grease to all electrical connections prior to assembly.

- d. Install connector of wiring harness (Figure 3, Item 6) to corresponding connector on membrane panel assembly (not shown).
  - e. Install new handle (Figure 3, Item 9) (supplied with new engine control switch (Figure 3, Item 5) to engine control switch (Figure 3, Item 5) and tighten set screw (not shown) to secure.
12. Install DCS control panel assembly (Install DCS Control Panel Assembly task).

### END OF TASK

#### Install DCS Control Panel Assembly

1. Remove protective strips from self-adhesive surface of new gasket (Figure 1, Item 3).
2. Align the mounting holes carefully and apply new gasket (Figure 1, Item 3) to rear face of DCS control panel (Figure 1, Item 6).

### CAUTION

Do not secure DCS control panel (Figure 1, Item 6) at this time.

3. Position DCS control panel (Figure 1, Item 6) to its mounting location on DCS enclosure (Figure 1, Item 2). Do not secure at this time.
4. Lift DCS control panel (Figure 1, Item 6) far enough from DCS enclosure (Figure 1, Item 2) to allow access to wiring harnesses.

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## CAUTION

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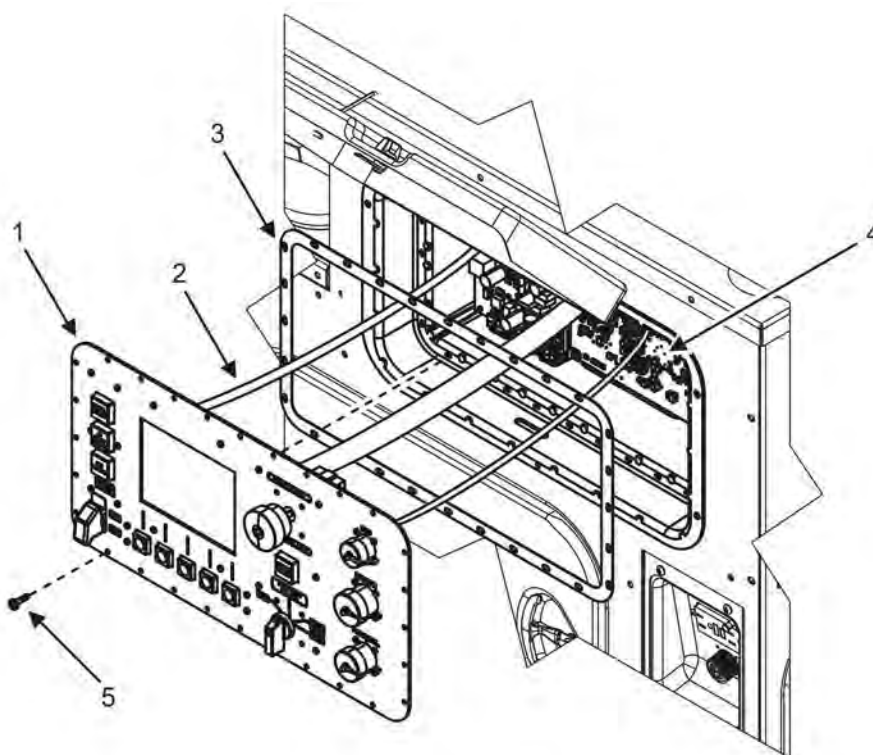
Ensure hooks on all wiring harnesses are latched properly after installation. Failure to comply may cause damage to equipment.

5. Install three wiring harnesses to DCS control panel (Figure 1, Item 6) at the corresponding connectors using tags applied at removal as a guide:
  - a. Install six-pin wiring harness (Figure 1, Item 4) to main control card (not shown).
  - b. Install 22-pin wiring harness (Figure 1, Item 5) to main control card (not shown).
  - c. Install 14-pin wiring harness (Figure 1, Item 8) to power supply control card (not shown).
6. Position DCS control panel (Figure 1, Item 6) to its mounting location on DCS enclosure (Figure 1, Item 2) and align the mounting holes.
7. Secure DCS control panel (Figure 1, Item 6) to DCS enclosure (Figure 1, Item 2) by installing 28 screws (Figure 1, Item 7).
8. Tighten 28 screws (Figure 1, Item 7) to 15.9 – 19.5 in/lb (1.8 – 2.2 Nm).
9. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
10. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
11. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
12. Repair as required.
13. Close DCS door.

## END OF TASK

### Check DCS Diagnostic LEDs

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open DCS door and secure in open position.



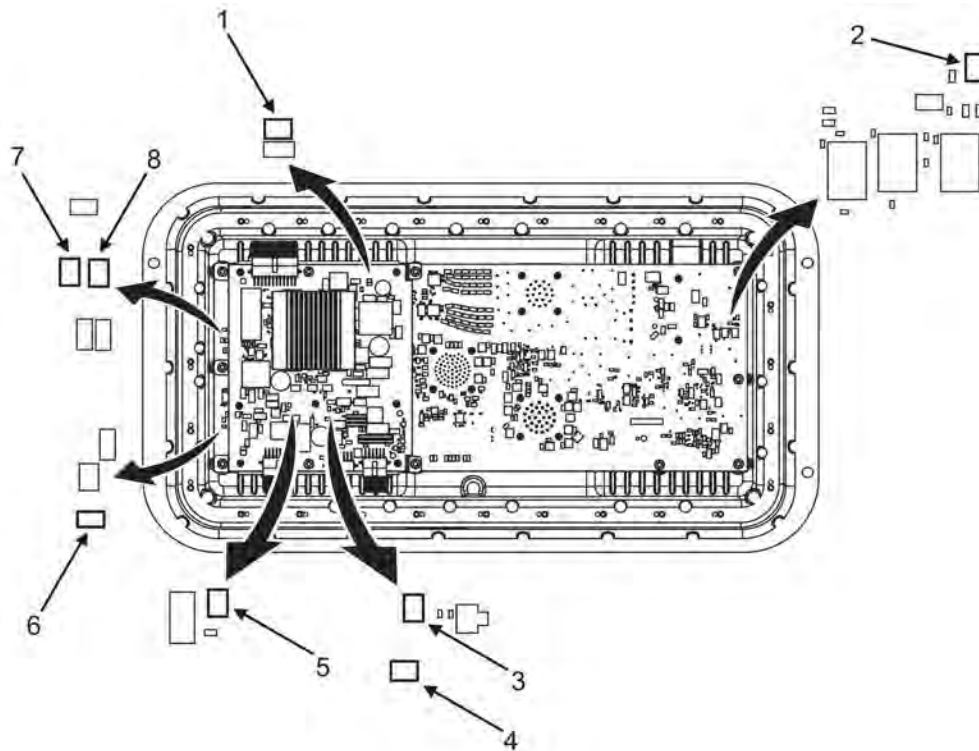
**Figure 4. Accessing DCS Diagnostic LEDs.**

3. Remove and discard 28 locking screws (Figure 4, Item 5) securing DCS control panel (Figure 4, Item 1) to DCS enclosure (Figure 4, Item 4).
4. Pull DCS control panel (Figure 4, Item 1) from DCS enclosure (Figure 4, Item 4) far enough to view printed circuit cards in rear of DCS enclosure (Figure 4, Item 4) and on rear of DCS control panel (Figure 4, Item 1).
5. Inspect seal (Figure 4, Item 3) between DCS enclosure (Figure 4, Item 4) and DCS control panel (Figure 4, Item 1) for signs of obvious damage. Remove and discard seal (Figure 4, Item 3) if damaged (WP 0017, Remove/Install DCS).
6. Secure DCS control panel (Figure 4, Item 1) with baling wire in a position that does not put stress on three cables (Figure 4, Item 2) running from DCS enclosure (Figure 4, Item 4) to DCS control panel (Figure 4, Item 1).

### NOTE

Several LEDs should illuminate when engine control switch is in the PRIME & RUN position.

7. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
8. Troubleshoot electrical system (WP 0009, Electrical System Troubleshooting without a DCS Code) if LEDs do not illuminate.



**Figure 5. DCS Enclosure LEDs.**

9. Observe LEDs on printed circuit boards inside DCS enclosure (Figure 4, Item 4).
10. Consult Figure 5 and Table 1 for proper function of LEDs.

**Table 1. DCS Enclosure LEDs.**

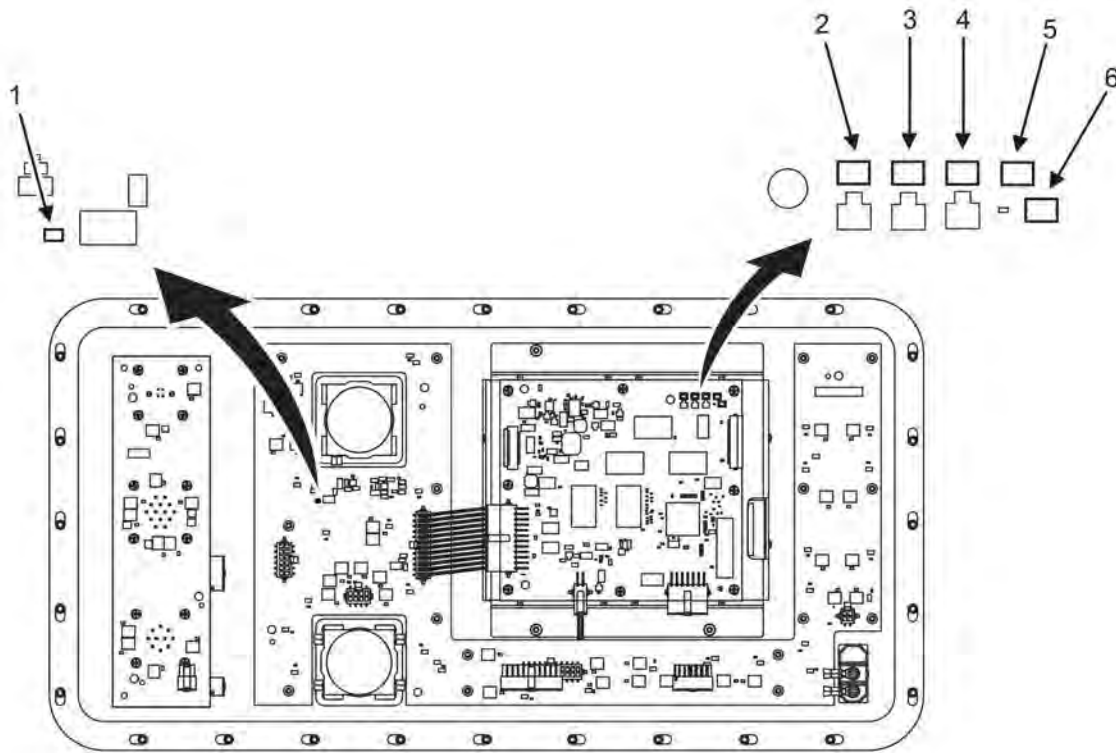
LED INDICATOR	DESCRIPTION	BLINK RATE/STATUS	SERVICE STEPS REQUIRED
5216 HEARTBEAT DS200 (Figure 5, Item 8)	Main processor function LED. The color is green.	<ol style="list-style-type: none"> <li>1. [Normal Mode]: Blinks at 0.5 Hz (1 sec on, 1 sec off) when U206 is running normally with application firmware.</li> <li>2. [Boot Mode]: Blinks at 2 Hz (0.25 sec on, 0.25 sec off) when U206 is running boot firmware.</li> <li>3. [OFF Mode]: Not blinking.</li> <li>4. [Abnormal Mode]: 100% on.</li> </ol>	<ol style="list-style-type: none"> <li>1. [Normal Mode]: None.</li> <li>2. [Boot Mode]: Load firmware into controller. Use InPower AMMPS Service Tool software.</li> <li>3. [OFF Mode]: Check power to the controller. Make sure EMERGENCY STOP is not active. Rotate engine control switch from OFF position. If DS300 is blinking normally and DS200 is not blinking, see step 11.</li> <li>4. [Abnormal Mode]: See step 11.</li> </ol>
COMMON ALARM DS201 (Figure 5, Item 7)	Common alarm LED. The color is red.	LED is active when there is a warning or shutdown fault on the generator set.	Check warning/fault status on DCS. Take appropriate service response. Press FAULT RESET on DCS to clear the fault indicator.



Table 1. DCS Enclosure LEDs — Continued.

LED INDICATOR	DESCRIPTION	BLINK RATE/STATUS	SERVICE STEPS REQUIRED
5213 HEARTBEAT DS300 (Figure 5, Item 6)	Main control co-processor function LED. The color is green.	<ol style="list-style-type: none"> <li>1. [Normal Mode]: Blinks at 0.5 Hz (1 sec on, 1 sec off) when U206 is running normally with application firmware.</li> <li>2. [Boot Mode]: Blinks at 2 Hz (0.25 sec on, 0.25 sec off) when U206 is running boot firmware.</li> <li>3. [OFF Mode]: Not blinking.</li> <li>4. [Abnormal Mode]: 100% on.</li> </ol>	<ol style="list-style-type: none"> <li>1. [Normal Mode]: None.</li> <li>2. [Boot Mode]: Load firmware into controller. Use InPower AMMPS Service Tool software.</li> <li>3. [OFF Mode]: Check power to the controller. Make sure EMERGENCY STOP is not active. Rotate engine control switch from OFF position. If DS200 is blinking normally and DS300 is not blinking, see step 11.</li> <li>4. [Abnormal Mode]: See step 11.</li> </ol>
DS1100 (Figure 5, Item 2)	Automatic Voltage Regulator (AVR) power supply status LED. The color is green.	If the DCS is powered and running normally, the LED will be active (on). This LED indicates the AVR section of the main board has power.	If the LED is off, check power to the controller. Make sure EMERGENCY STOP is not active. Rotate engine control switch from OFF position. If the LED does not turn on and the processor LEDs are working normally, see step 11.
DS100 (Figure 5, Item 1)	Non-isolated power supply LED. The color is green.	Should be 100% on when the DCS is powered and running normally.	If LED is off, check that DCS is powered normally and EMERGENCY STOP is not active. If DCS is powered normally and LED is inactive, see step 11.
DS101 (Figure 5, Item 5)	Isolated power supply LED. The color is green.	Should be 100% on when the DCS is powered and running normally.	If LED is off, check that DCS is powered normally and EMERGENCY STOP is not active. If DCS is powered normally and LED is inactive, see step 11.
DS200 (Figure 5, Item 4)	DCS control power LED. The color is green.	Should be 100% on when the DCS is powered and running normally. This will be off if the DCS is not powered up and running.	If LED is off, check that DCS is powered normally and EMERGENCY STOP is not active. If DCS is powered normally and LED is inactive, see step 11.
DS201 (Figure 5, Item 3)	Power supply control card heater LED. The color is green.	LED is normally off. This LED goes on when the DCS heater system is active. This will be at extremely low ambient temperatures (-51°F – -33°F (-46°C – -36°C)).	No service steps are required. Normal operation is not affected by this circuit. Only low temperature conditions can verify the operation of this circuit.

11. Replace DCS (WP 0017, Remove/Install DCS) if LEDs do not function IAW Table 1.



**Figure 6. DCS Control Panel LEDs.**

12. Observe LEDs on printed circuit boards on rear of DCS control panel (Figure 4, Item 1).
13. Consult Figure 6 and Table 2 for proper function of LEDs.

**Table 2. DCS Control Panel LEDs.**

LED INDICATOR	DESCRIPTION	BLINK RATE/STATUS	SERVICE STEPS REQUIRED
DS1 (Figure 6, Item 6)	3.3 V DCS power LED. The color is green.	Should be 100% on when the DCS is powered and running normally.	If LED is off, check that DCS is powered normally and EMERGENCY STOP is not active. If DCS is powered normally and LED is inactive, see step 14.
DS2 (Figure 6, Item 2)	Display controller microcontroller status LED. The color is green.	<ol style="list-style-type: none"> <li>1. [OFF Mode]: LED is off.</li> <li>2. [Initialization Mode]: Blinks very fast during power-up initialization.</li> <li>3. [Boot Mode]: Blinks at 2 Hz (0.25 sec on, 0.25 sec off) when U1 is running the boot block firmware.</li> <li>4. [Normal Mode]: Blinks at 0.5 Hz (1 sec on, 1 sec off) when U1 microcontroller is running the application firmware.</li> <li>5. [Abnormal Mode]: 100% on. This indicates the system is not running and has a fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. If LED is off, check that DCS is powered normally and EMERGENCY STOP is not active.</li> <li>2. If device is in initialization mode, wait 10 sec and check again. If system does not leave initialization mode, check for [Boot Mode] and see step 14.</li> <li>3. If device is in the boot mode, load firmware into controller with InPower AMMPS software loaded on Maintenance Support Device (MSD).</li> <li>4. Normal mode requires no service actions to this assembly.</li> <li>5. If device LED is stuck 100% on, see step 14.</li> </ol>

Table 2. DCS Control Panel LEDs — Continued.

LED INDICATOR	DESCRIPTION	BLINK RATE/STATUS	SERVICE STEPS REQUIRED
DS3 (Figure 6, Item 3)	Display controller main controller communication LED. The color is red.	LED is normally off.	If LED is off, no service action is required. If LED is on, wait 10 sec for LED to turn off as communications initialize. If LED stays on indefinitely, check the cables between the main controller and the display controller. If LED stays on and cables are ok, see step 14.
DS4 (Figure 6, Item 4)	LCD glass heater LED The color is green.	LED is normally off. LED goes on when the DCS heater system is active. This will be at extremely low ambient temperatures (-51°F – -4°F (-46°C – -20°C)).	If ambient temperatures are above 32°F (0°C) and this LED is active, check display controller function. Check the cables for a short circuit between wires. See step 14 if LED is always active at temperatures above 32°F (0°C).
DS5 (Figure 6, Item 5)	Display controller heater LED. The color is yellow.	LED is normally off. LED goes on when the DCS heater system is active. This will be at extremely low ambient temperatures (-51°F – -33°F (-46°C – -36°C)).	No service steps are required. Normal operation is not affected by this circuit. Only low temperature conditions can verify the operation of this circuit.
DS28 (Figure 6, Item 1)	Temperature sense circuitry LED. The color is green.	Should be 100% on when the DCS is powered and running normally.	If LED is off, check that DCS is powered normally and EMERGENCY STOP is not active. If DCS is powered normally and LED is inactive, see step 14.

14. Replace DCS (WP 0017, Remove/Install DCS) if LEDs do not function IAW Table 1.

### NOTE

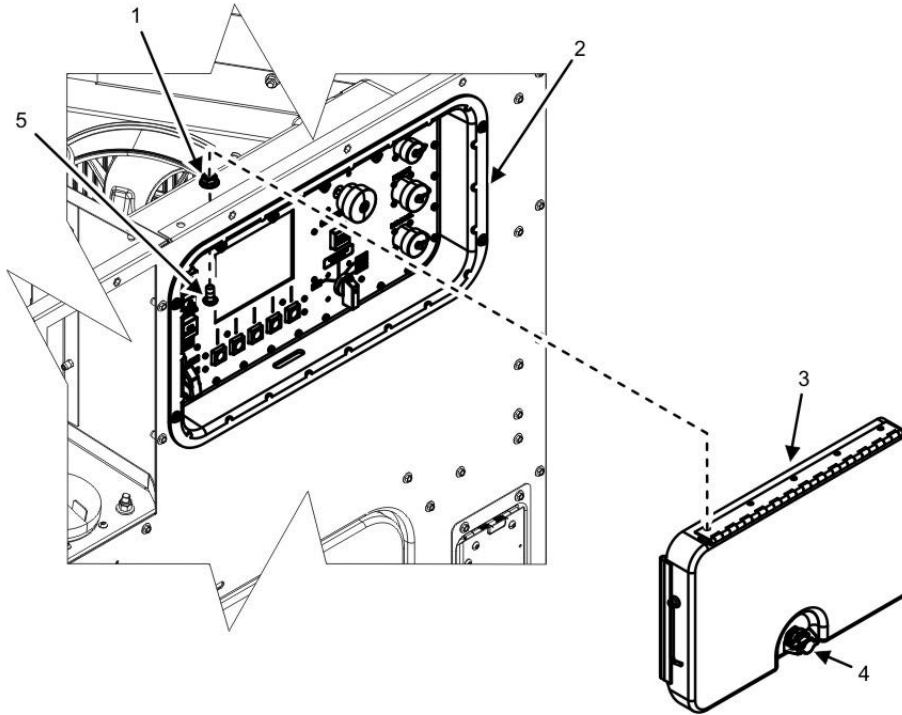
LEDs should go off after DCS powers down when engine control switch is in the OFF position.

15. Turn engine control switch to OFF (TM 9-6115-752-10).
16. Install new seal (Figure 4, Item 3) to DCS enclosure (Figure 4, Item 4) if old seal was removed. See Install DCS Control Panel Assembly task.
17. Position DCS control panel (Figure 4, Item 1) to its mounting location on DCS enclosure (Figure 4, Item 4) and align the mounting holes.
18. Secure DCS control panel (Figure 4, Item 1) to DCS enclosure (Figure 4, Item 4) by installing 28 new locking screws (Figure 4, Item 5). Tighten 28 locking screws (Figure 4, Item 5) to 15.9 – 19.5 in/lb (1.8 – 2.2 Nm).
19. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
20. Start engine and check for proper operation (TM 9-6115-752-10).
21. Repair as required.
22. Close DCS door.

### END OF TASK

### Remove DCS Door Assembly

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove negative ground cable from right-hand battery (WP 0037, Remove/Install Batteries).
3. Remove top body panel (WP 0029, Remove/Install Top Body Panel).

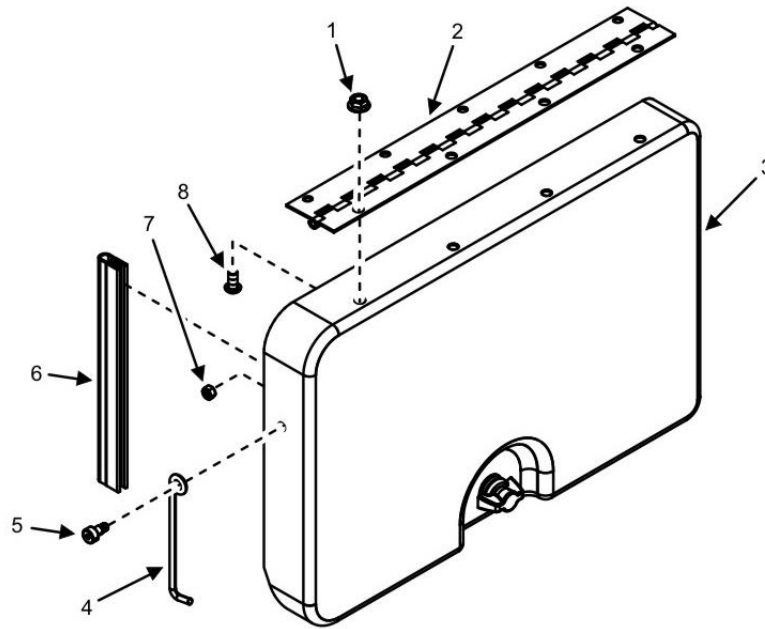


**Figure 7. DCS Door — Removal.**

4. Support DCS door (Figure 7, Item 3) and remove five nuts (Figure 7, Item 1) and five screws (Figure 7, Item 5) that secure DCS door (Figure 7, Item 3) to DCS enclosure (Figure 7, Item 2).
5. Rotate DCS door latch (Figure 7, Item 4) and remove DCS door (Figure 7, Item 3) from unit.
6. Place DCS door (Figure 7, Item 3) on a suitable work surface.

**END OF TASK**

### Disassemble DCS Door Assembly



**Figure 8. DCS Door — Disassembly.**

1. Remove four screws (Figure 8, Item 8), four nuts (Figure 8, Item 1), and hinge (Figure 8, Item 2), from DCS door (Figure 8, Item 3).
2. Remove one screw (Figure 8, Item 5), one lock nut (Figure 8, Item 7), and door prop (Figure 8, Item 4) from DCS door (Figure 8, Item 3). Discard lock nut (Figure 8, Item 7).
3. Remove two rubber bumpers (Figure 8, Item 6) from edges of DCS door (Figure 8, Item 3).

### END OF TASK

#### Inspect DCS Door Components

1. Inspect hinge (Figure 8, Item 2). Replace hinge (Figure 8, Item 2) if bent, corroded, or binding.
2. Inspect door prop (Figure 8, Item 4). Replace door prop (Figure 8, Item 4) if bent, cracked, or broken.
3. Inspect rubber bumpers (Figure 8, Item 6). Replace rubber bumpers (Figure 8, Item 6) if cracked or torn.
4. Inspect DCS door (Figure 8, Item 6). Replace DCS door (Figure 8, Item 3) if punctured, cracked, corroded, or badly bent. Repair minor dents by hammering out.

### END OF TASK

#### Assemble DCS Door Assembly

1. Install two rubber bumpers (Figure 8, Item 6) to the inside edges of DCS door (Figure 8, Item 3).
2. Position prop (Figure 8, Item 4) to its mounting position on outside of DCS door (Figure 8, Item 3) and secure by installing screw (Figure 8, Item 5) and new lock nut (Figure 8, Item 7).

- 
3. Position hinge (Figure 8, Item 2) to DCS door (Figure 8, Item 3) and secure by installing four screws (Figure 8, Item 8) and four nuts (Figure 8, Item 1).

**END OF TASK****Install DCS Door Assembly**

1. Position DCS door (Figure 7, Item 3) to its mounting position on DCS enclosure (Figure 7, Item 2).
2. Support DCS door (Figure 7, Item 3) while installing five screws (Figure 7, Item 5) and five nuts (Figure 7, Item 1) to secure DCS door (Figure 7, Item 3) to DCS enclosure (Figure 7, Item 2).
3. Close DCS door (Figure 7, Item 3) and secure latch (Figure 7, Item 4).
4. Install top body panel (WP 0029, Remove/Install Top Body Panel).
5. Install battery ground cable (WP 0037, Remove/Install Batteries).
6. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
7. Start engine and check for proper operation (TM 9-6115-752-10).
8. Repair as required.

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL AIR INTAKE HOSE ASSEMBLIES**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Clamp(3) (WP 0113, Repair Parts List, Figure 8, Item 11)

Hose, air (WP 0113, Figure 8, Item 4)

Hose, air (WP 0113, Figure 8, Item 12)

Rag, wiping (WP 0180, Expendable and Durable Items List, Item 33)

**Personnel Required**

91D (1)

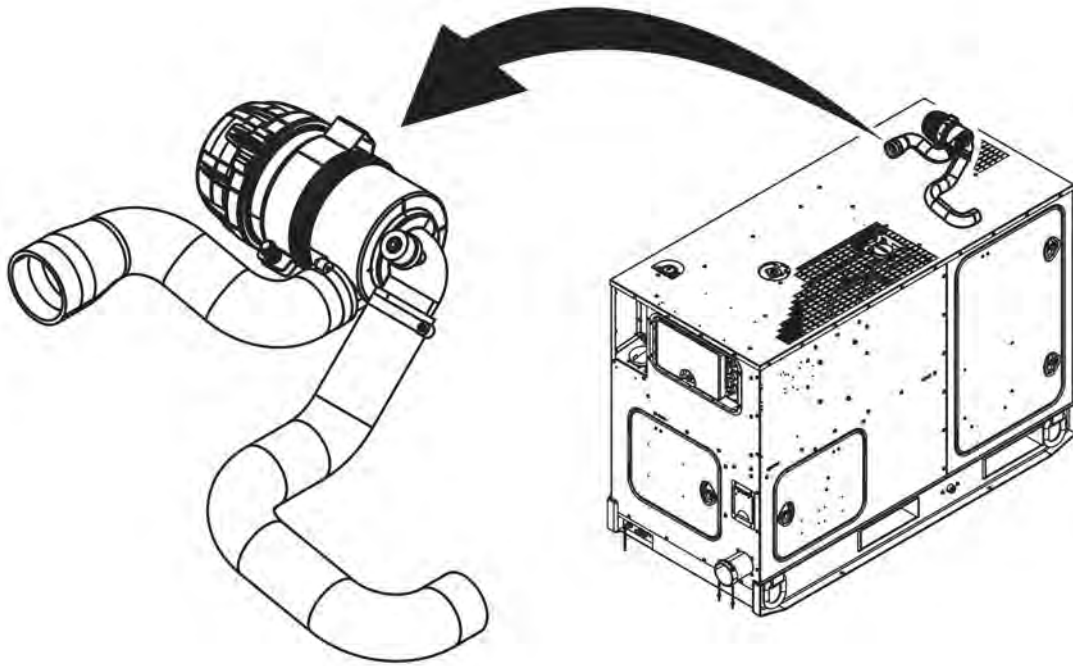
**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

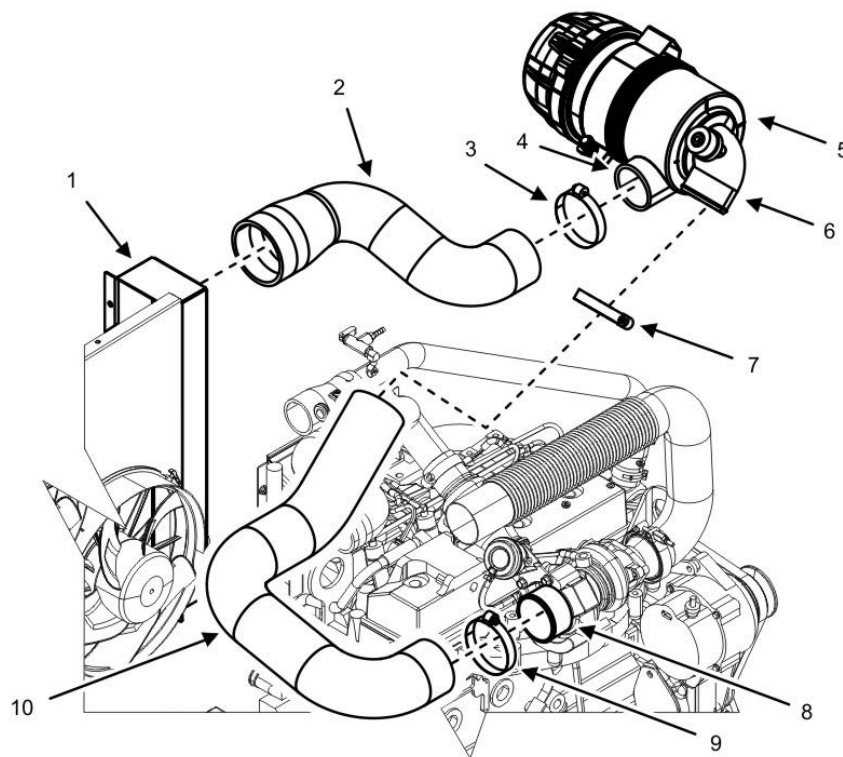
Top body panel removed (WP 0029, Remove/Install Top Body Panel)

**REMOVE/INSTALL AIR INTAKE HOSE ASSEMBLIES****Remove Air Intake Air Hose Assemblies**

**Figure 1. Air Intake Hose Assembly — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate air hose intake assembly (Figure 1).





**Figure 2. Air Intake Hose Assembly — Detail.**

3. Loosen clamp (Figure 2, Item 3) securing air hose (Figure 2, Item 2) to intake port (Figure 2, Item 4) on side of air cleaner assembly (Figure 2, Item 5).
4. Remove air intake hose (Figure 2, Item 2) and clamp (Figure 2, Item 3) from intake port (Figure 2, Item 4) on side of air cleaner assembly (Figure 2, Item 5).
5. Remove air hose (Figure 2, Item 2) from air plenum (Figure 2, Item 1) by pulling air hose (Figure 2, Item 2) out of mounting hole in air plenum (Figure 2, Item 1).
6. Remove air hose (Figure 2, Item 2) from unit and place on a suitable work surface.
7. Open right-side door.
8. Loosen clamp (Figure 2, Item 9) securing air hose (Figure 2, Item 10) to turbocharger (Figure 2, Item 8).
9. Loosen clamp (Figure 2, Item 7) securing air hose (Figure 2, Item 10) to elbow fitting (Figure 2, Item 6) on top of air cleaner assembly (Figure 2, Item 5).
10. Remove air hose (Figure 2, Item 10) from unit and place on a suitable work surface.
11. Discard clamps (Figure 2, Items 3, 7, and 9).

**END OF TASK**

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**Inspect Air Intake Hose Assemblies**

1. Inspect all air hoses (Figure 2, Items 2 and 10) for cracks, deterioration, or damage. Replace as required.
2. Inspect all air hoses (Figure 2, Items 2 and 10) and remove any debris, dirt, or kinks. Replace hose if blockage cannot be removed.

**END OF TASK****Install Air Intake Hose Assemblies****NOTE**

Wipe down hoses, parts, and connectors with wiping rag prior to installation.

1. Position air hose (Figure 2, Item 10) and clamp (Figure 2, Item 7) on elbow fitting (Figure 2, Item 6) of air cleaner assembly (Figure 2, Item 5).
2. Position opposite end of air hose (Figure 2, Item 10) and clamp (Figure 2, Item 9) to mounting location on turbocharger (Figure 2, Item 8).
3. Verify proper seating of air hose (Figure 2, Item 10) and alignment of clamps (Figure 2, Items 7 and 9) at each end of air hose (Figure 2, Item 10).

**CAUTION**

Take care not to over-tighten clamps on air hoses. Failure to comply may cause damage to equipment.

4. Secure ends of air hose (Figure 2, Item 10) to elbow fitting (Figure 2, Item 6) on air cleaner assembly (Figure 2, Item 5) and to mounting location on turbocharger (Figure 2, Item 8) with clamps (Figure 2, Items 7 and 9).
5. Close right-side door.
6. Position air hose (Figure 2, Item 2) and clamp (Figure 2, Item 3) to intake port (Figure 2, Item 4) on side of air cleaner assembly (Figure 2, Item 5).
7. Place opposite end of air hose (Figure 2, Item 2) into mounting location on air plenum (Figure 2, Item 1).
8. Check for proper seating of air hose (Figure 2, Item 2) and alignment of clamp (Figure 2, Item 3) at air cleaner end of air hose (Figure 2, Item 2).
9. Secure air cleaner end of air hose (Figure 2, Item 2) to intake port (Figure 2, Item 4) on side of air cleaner assembly (Figure 2, Item 5) using clamp (Figure 2, Item 3).
10. Push opposite end of air intake hose (Figure 2, Item 2) firmly into air plenum (Figure 2, Item 1).
11. Install top body panel (WP 0029, Remove/Install Top Body Panel).
12. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
13. Close generator set doors.
14. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
15. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
16. Repair as required.

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**SERVICE AIR CLEANER**

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**INITIAL SETUP:**

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Element, air filter (WP 0113, Repair Parts List, Figure 8, Item 9)

Rag, wiping (WP 0180, Expendable and Durable Items List, Item 33)

Sealant (WP 0180, Item 34)

**Personnel Required**

91D

Assistant

**Equipment Conditions**

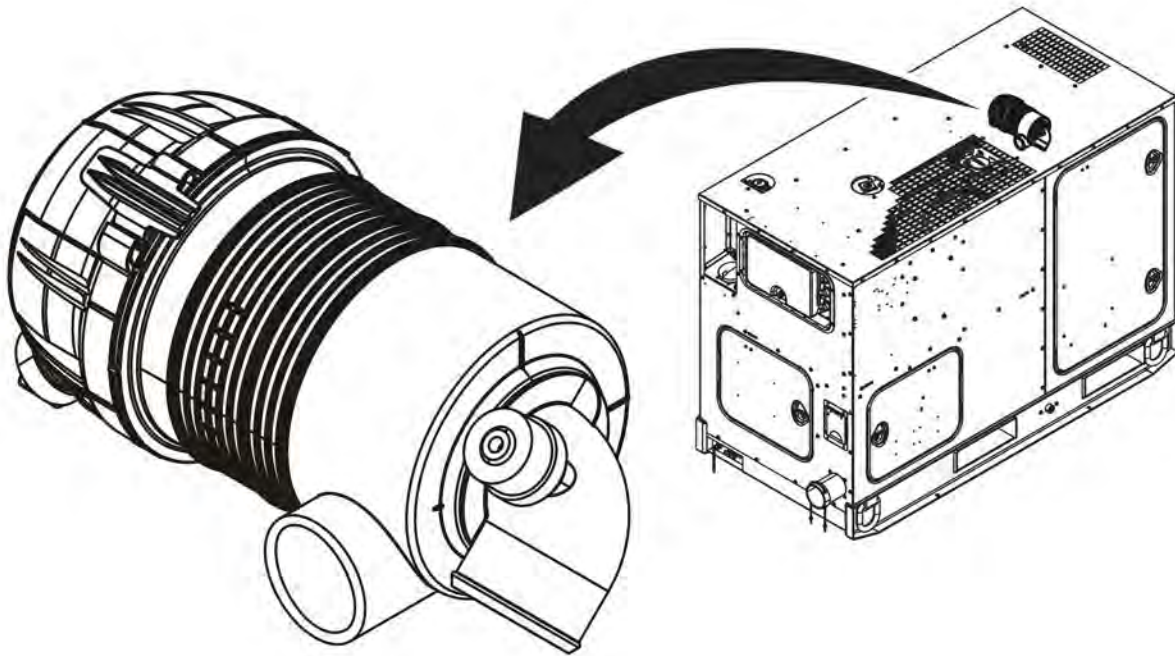
Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Air filter restriction indicator shows restricted filter (TM 9-6115-752-10)

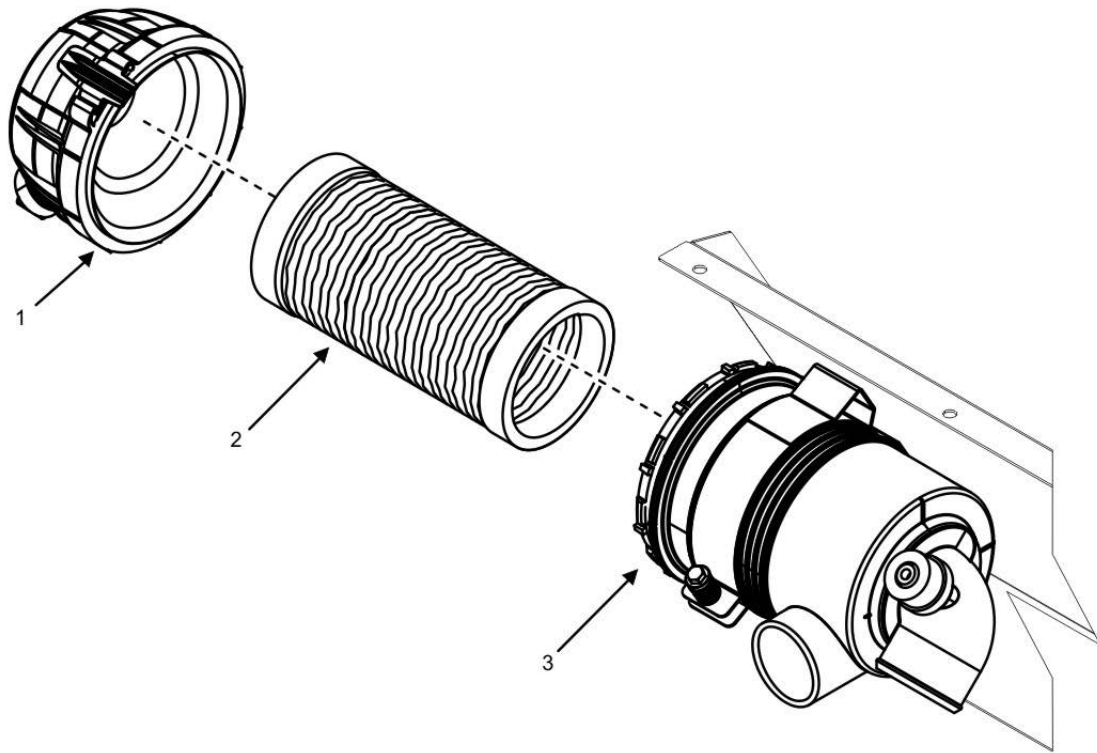
Battery disconnected (WP 0037, Remove/Install Batteries)

Top body panel removed (WP 0029, Remove/Install Top Body Panel)

**SERVICE AIR CLEANER****Remove Air Cleaner Filter Element**

**Figure 1. Air Cleaner — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door to locate air cleaner assembly (Figure 1).



**Figure 2. Air Cleaner Assembly.**

3. Release lock lever on air cleaner base (Figure 2, Item 1) and twist base counterclockwise until resistance is felt.
4. Pull air cleaner base (Figure 2, Item 1) straight out to expose air filter element (Figure 2, Item 2) and remove air cleaner base (Figure 2, Item 1) from unit.
5. Inspect air cleaner base (Figure 2, Item 1) for damage or corrosion, and replace as required.
6. Turn end of air filter element (Figure 2, Item 2) in either direction to disengage seal.
7. Remove air filter element (Figure 2, Item 2) gently from air cleaner assembly (Figure 2, Item 3) by pulling outward, and discard used air filter element (Figure 2, Item 2).
8. Inspect air cleaner assembly (Figure 2, Item 3) for damage or corrosion, and replace as required. See Remove Air Cleaner Assembly task and Install Air Cleaner Assembly task.

## **END OF TASK**

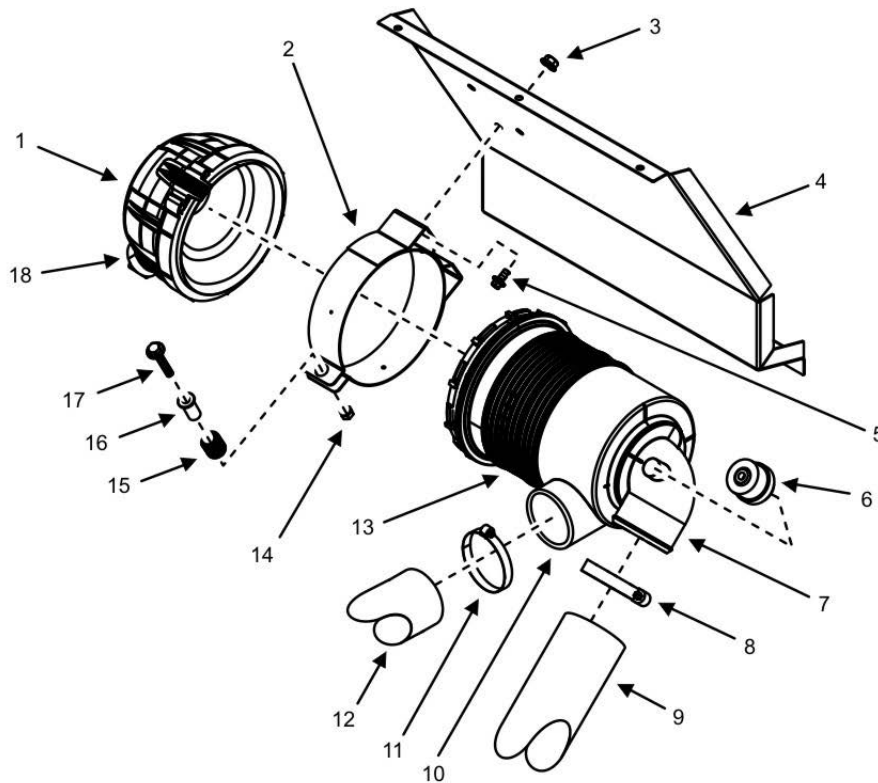
### **Install Air Cleaner Filter Element**

1. Remove dirt and debris from air cleaner base (Figure 2, Item 1), sealing surfaces, and inside of air cleaner assembly (Figure 2, Item 3).
2. Insert new air filter element (Figure 2, Item 2) into air cleaner assembly (Figure 2, Item 3) and twist in either direction to secure.

**NOTE**

When air cleaner base (Figure 2, Item 1) is placed on bottom of air cleaner assembly (Figure 2, Item 3) and turned clockwise, a click can be heard when the air cleaner base (Figure 2, Item 1) is properly secured.

3. Position air cleaner base (Figure 2, Item 1) to mounting location on air cleaner assembly (Figure 2, Item 3) and turn clockwise to secure.

**Legend**

- |                                     |                          |
|-------------------------------------|--------------------------|
| 1. Air Cleaner Base                 | 10. Intake Valve         |
| 2. Mounting Bracket                 | 11. Hose Clamp           |
| 3. Nut                              | 12. Air Intake Hose      |
| 4. Weather Shield                   | 13. Air Cleaner Assembly |
| 5. Screw                            | 14. Nut                  |
| 6. Air Filter Restriction Indicator | 15. Spring               |
| 7. Air Cleaner Elbow                | 16. Spacer               |
| 8. Hose Clamp                       | 17. Bolt                 |
| 9. Air Hose                         | 18. Dust Ejection Valve  |

**Figure 3. Air Cleaner Assembly — Detail.**

4. Reset air filter restriction indicator (Figure 3, Item 6) on air cleaner assembly (Figure 3, Item 13) by pushing yellow button on air filter restriction indicator (Figure 3, Item 6).
5. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
6. Close left-side door on generator set.

7. Set engine control switch to PRIME & RUN. (TM 9-6115-752-10)
8. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
9. Repair as required.

## END OF TASK

### Remove Air Cleaner Assembly

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove air hose (Figure 3, Item 9) connecting air cleaner assembly (Figure 3, Item 13) to turbocharger (not shown) by loosening hose clamp (Figure 3, Item 8) on air hose (Figure 3, Item 9) at air cleaner elbow (Figure 3, Item 7).
3. Remove two screws (Figure 3, Item 5) and two nuts (Figure 3, Item 3) securing mounting bracket (Figure 3, Item 2) to weather shield (Figure 3, Item 4).
4. Loosen and remove clamp (Figure 3, Item 11) on air intake hose (Figure 3, Item 12).
5. Remove air intake hose (Figure 3, Item 12) from air plenum (not shown) and intake valve (Figure 3, Item 10) of air cleaner assembly (Figure 3, Item 13).
6. Remove air cleaner assembly (Figure 3, Item 13) in mounting bracket (Figure 3, Item 2) from unit and place on suitable work surface.
7. Inspect air cleaner assembly (Figure 3, Item 13) and mounting bracket (Figure 3, Item 2) for damage or corrosion, and replace as required.
8. Inspect hose clamps (Figure 3, Items 8 and 11), screws (Figure 3, Item 5), and nuts (Figure 3, Item 3) for damage or corrosion, and replace as required.

## END OF TASK

### Install Air Cleaner Assembly

#### NOTE

If mounting bracket (Figure 3, Item 2) on air cleaner assembly (Figure 3, Item 13) has not been loosened or removed, mounting the air cleaner assembly (Figure 3, Item 13) on the weather shield (Figure 3, Item 4) should properly align the air hose connections with the plenum and the turbocharger.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Ensure that mounting bracket (Figure 3, Item 2) is properly seated around center of air cleaner assembly (Figure 3, Item 13).
3. Install air cleaner assembly (Figure 3, Item 13) to weather shield (Figure 3, Item 4) using two screws (Figure 3, Item 5) and two nuts (Figure 3, Item 3).
4. Adjust air cleaner assembly (Figure 3, Item 13) as necessary to make proper hose connections by rotating assembly inside mounting bracket (Figure 3, Item 2).
5. Install end of air intake hose (Figure 3, Item 12) from air plenum (not shown) to air cleaner assembly (Figure 3, Item 13) and secure with hose clamp (Figure 3, Item 11).
6. Install end of air hose (Figure 3, Item 9) from turbocharger (not shown) onto air cleaner elbow (Figure 3, Item 7) on air cleaner assembly (Figure 3, Item 13) and secure hose with hose clamp (Figure 3, Item 8).
7. Close generator set doors.

8. Install top body panel on generator set (WP 0029, Remove/Install Top Body Panel).
9. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
10. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
11. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
12. Repair as required.

## END OF TASK

### Disassemble Air Cleaner Assembly

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove air cleaner from unit. See Remove Air Cleaner Assembly task.
3. Remove air cleaner filter element. See Remove Air Cleaner Filter Element task.
4. Rotate air filter restriction indicator (Figure 3, Item 6) counterclockwise from air cleaner elbow (Figure 3, Item 7) of air cleaner assembly (Figure 3, Item 13) to remove air filter restriction indicator (Figure 3, Item 6) from air cleaner assembly (Figure 3, Item 13).
5. Inspect air filter restriction indicator (Figure 3, Item 6) for excessive corrosion or other signs of damage, and replace as required.
6. Remove nut (Figure 3, Item 14), spring (Figure 3, Item 15), spacer (Figure 3, Item 16), and bolt (Figure 3, Item 17) securing mounting bracket (Figure 3, Item 2) around air cleaner assembly (Figure 3, Item 13).
7. Inspect nut (Figure 3, Item 14), spring (Figure 3, Item 15), spacer (Figure 3, Item 16), and bolt (Figure 3, Item 17) for corrosion and other signs of obvious damage, and replace as required.
8. Remove mounting bracket (Figure 3, Item 2) from air cleaner (Figure 3, Item 13) by expanding bracket (Figure 3, Item 2).
9. Inspect mounting bracket (Figure 3, Item 2) for corrosion, cracks, or other signs of damage, and replace as required.
10. Remove dust ejection valve (Figure 3, Item 18) from air cleaner base (Figure 3, Item 1).
11. Inspect dust ejection valve (Figure 3, Item 18) for corrosion, cracks, or other signs of damage, and replace as required.

## END OF TASK

### Assemble Air Cleaner Assembly

1. Clean all air cleaner assembly components thoroughly.
2. Install dust ejection valve (Figure 3, Item 18) onto air cleaner base (Figure 3, Item 1) with valve opening pointing downward.
3. Install mounting strap (Figure 3, Item 2) to weather shield (Figure 3, Item 4) with two screws (Figure 3, Item 5) and two nuts (Figure 3, Item 3).
4. Place air cleaner assembly (Figure 3, Item 13) into mounting bracket (Figure 3, Item 2), aligning air intake hose (Figure 3, Item 12) to intake valve (Figure 3, Item 10) and air hose (Figure 3, Item 9) to air cleaner elbow (Figure 3, Item 7).



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**NOTE**

Spacer (Figure 3, Item 16) and spring (Figure 3, Item 15) are installed on the mounting bracket (Figure 3, Item 2) bolt (Figure 3, Item 17) outside of the mounting bracket (Figure 3, Item 2), next to the bolt head. If the mounting bracket (Figure 3, Item 2) bolt (Figure 3, Item 17) is only installed finger-tight, the air cleaner assembly can be rotated as needed for precise installation.

5. Secure mounting bracket (Figure 3, Item 2) finger-tight to air cleaner assembly (Figure 3, Item 13) using nut (Figure 3, Item 14), spring (Figure 3, Item 15), spacer (Figure 3, Item 16), and bolt (Figure 3, Item 17).
6. Apply sealant to mounting threads of air filter restriction indicator (Figure 3, Item 6).
7. Install and secure air filter restriction indicator (Figure 3, Item 6) on air cleaner elbow (Figure 3, Item 7) of air cleaner assembly (Figure 3, Item 13) by turning indicator clockwise to tighten.
8. Install air cleaner filter element. See Install Air Cleaner Filter Element task.
9. Install air cleaner assembly into unit. See Install Air Cleaner Assembly task.
10. Tighten bolt (Figure 3, Item 17).
11. Install top body panel (WP 0029, Remove/Install Top Body Panel).
12. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
13. Close generator set doors.
14. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
15. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
16. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL CHARGE AIR COOLER**

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**INITIAL SETUP**

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Clamp, hose (8) (WP 0113, Repair Parts List, Figure 8, Item 14)

Cooler, charge air (WP 0113, Figure 8, Item 13)

Tube, charge air cooler (WP 0113, Figure 8, Item 16)

Tube, charge air cooler (WP 0113, Figure 8, Item 23)

Tube, flexible (2) (WP 0113, Figure 8, Item 15)

Rag, wiping (2) (WP 0180, Expendable and Durable Items List, Item 33)

**Personnel Required**

91D (1)

Assistant (1)

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Top body panel removed (WP 0029, Remove/Install Top Body Panel)

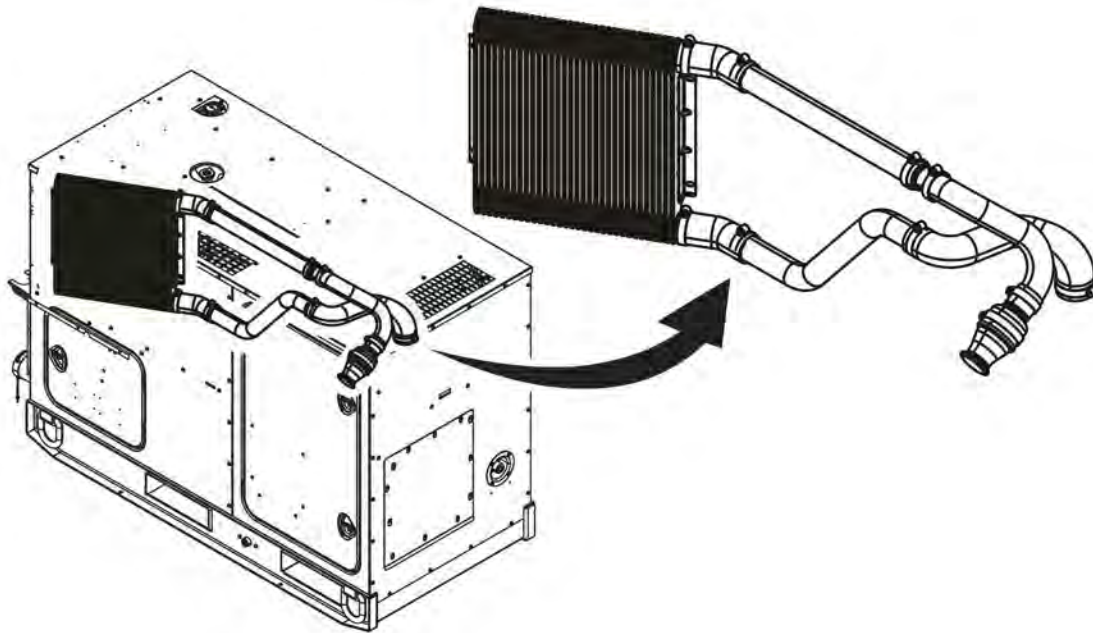
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**REMOVE/INSTALL CHARGE AIR COOLER**

**WARNING**

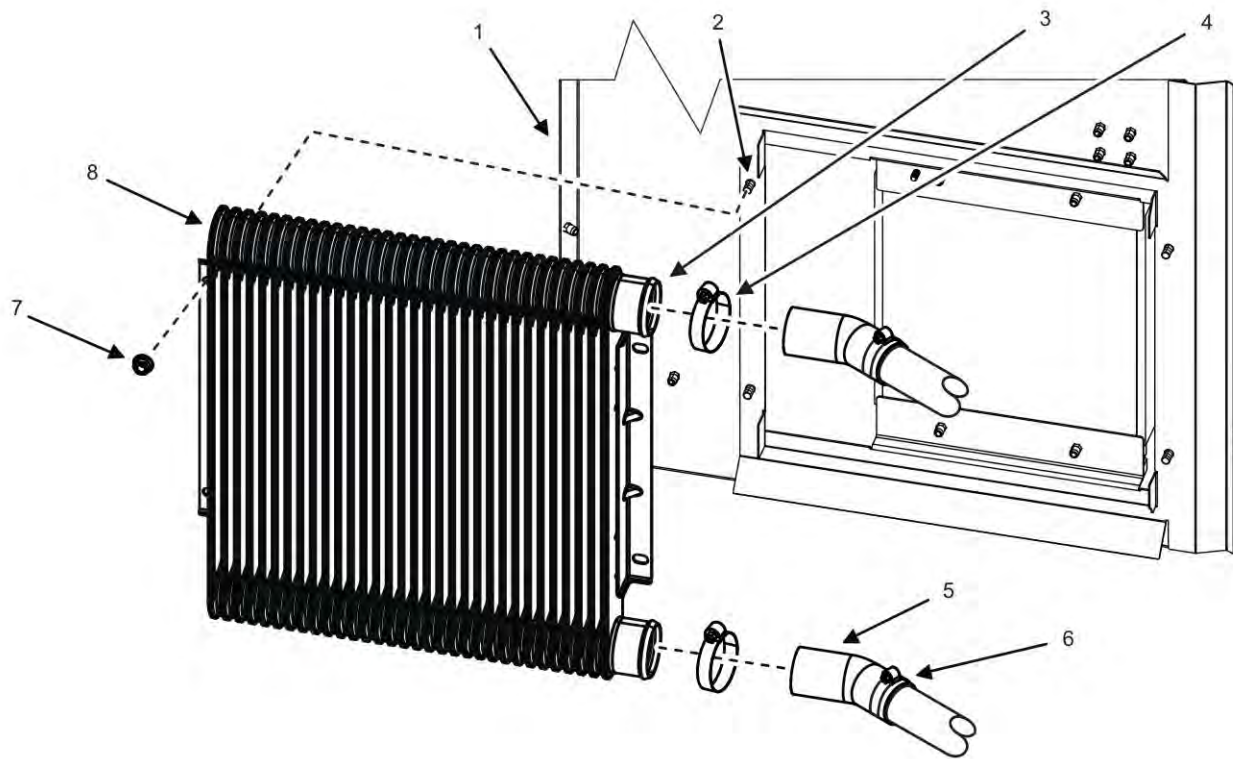
The surface of the charge air cooler may contain sharp edges. Handle with care. Failure to comply may cause injury or death to personnel.

## Remove Charge Air Cooler



**Figure 1. Charge Air Cooler — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate charge air cooler (Figure 1).



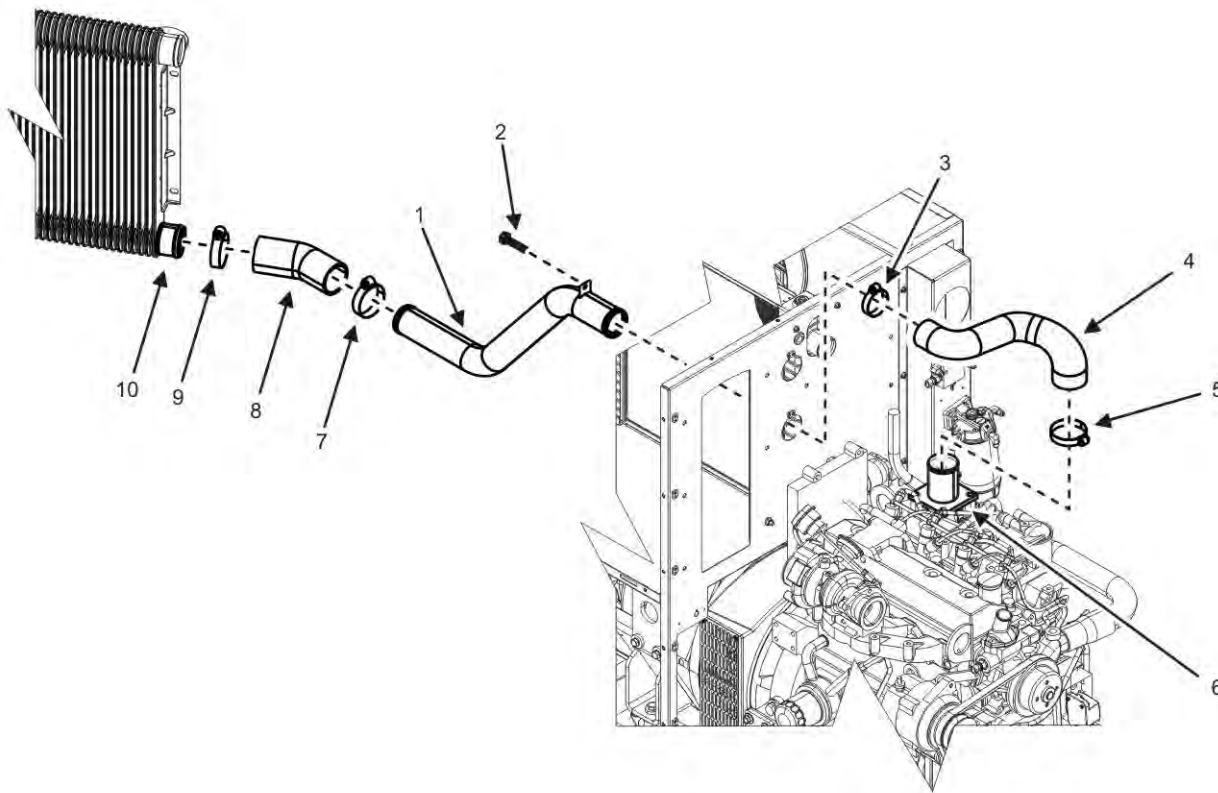
**Figure 2. Charge Air Cooler — Removal.**

3. Loosen hose clamps (Figure 2, Item 4) on flexible tubes (Figure 2, Item 5) attached to charge air cooler (Figure 2, Item 8) fittings (Figure 2, Item 3).
4. Remove four flange nuts (Figure 2, Item 7) securing charge air cooler (Figure 2, Item 8) to permanent screws (Figure 2, Item 2) in cooler support panel (Figure 2, Item 1).
5. Remove charge air cooler (Figure 2, Item 8) from cooler support panel (Figure 2, Item 1).
6. Disconnect charge air cooler (Figure 2, Item 8) from flexible tubes (Figure 2, Item 5) and charge air cooler tubes (Figure 2, Item 6).
7. Place charge air cooler (Figure 2, Item 8) on a suitable work surface.

#### **END OF TASK**

#### **Inspect Charge Air Cooler**

1. Inspect charge air cooler (Figure 2, Item 8) for cracks, corrosion, or other damage. Replace as required.
2. Inspect flexible tubes (Figure 2, Item 5) and charge air cooler tubes (Figure 2, Item 6) for cracks, corrosion, or other damage. Replace as required.



**Figure 3. Air Flow to Intake Manifold.**

3. Inspect flexible tube (Figure 3, Item 8), lower charge air cooler tube (Figure 3, Item 1) and hose clamps (Figure 3, Items 3, 5, 7, and 9) for cracks, corrosion, or other damage, and replace as required.
4. Inspect upper charge air cooler tube (Figure 4, Item 1), hose (Figure 4, Item 9), and connector tubes (Figure 4, Items 3 and 7) from compressor housing (Figure 4, Item 10) of turbocharger (Figure 4, Item 11) to upper charge air cooler tube (Figure 4, Item 1) for cracks, corrosion, or other damage, and replace as required.
5. Inspect all hose clamps (Figure 4, Item 2, 4, 6, 8, 13, and 15) for cracks, corrosion, or other damage, and replace as required.

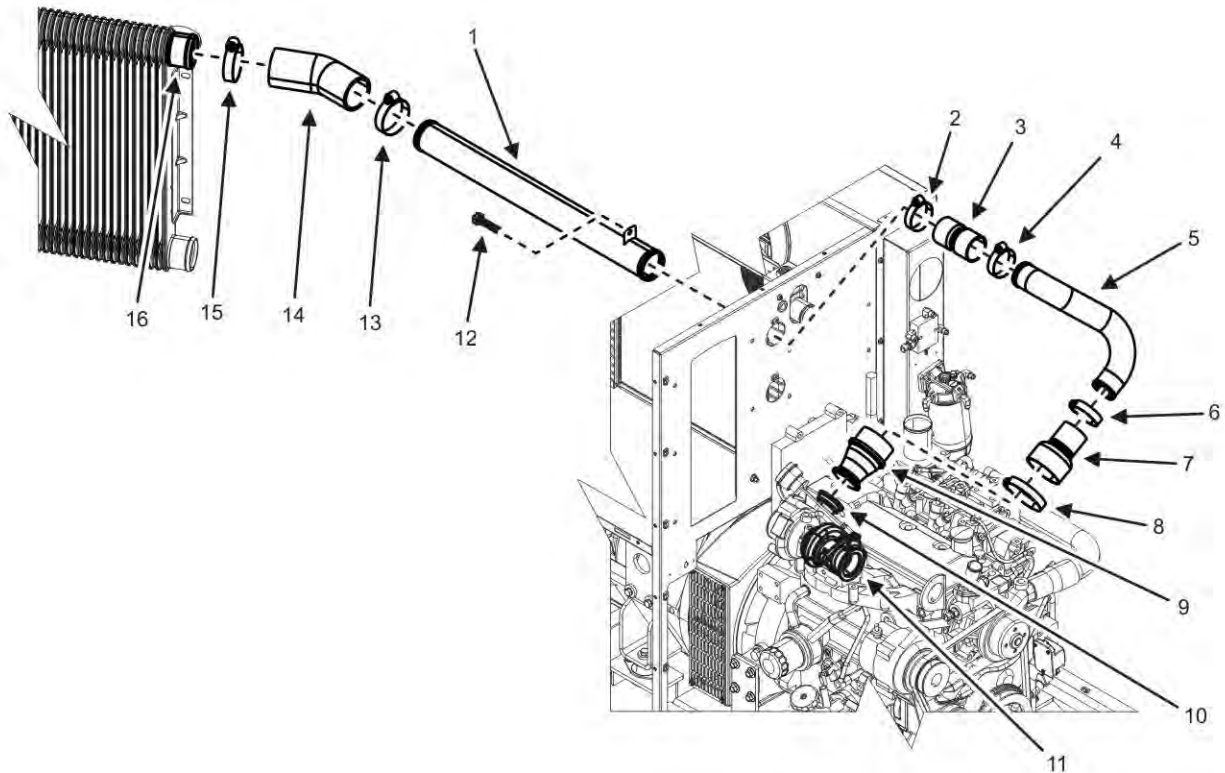
## END OF TASK

### Install Charge Air Cooler

## NOTE

Wipe down hoses, parts, and connectors with wiping rag prior to installation.

1. Place charge air cooler (Figure 5, Item 3) onto four permanent screws (Figure 5, Item 2) in cooler support panel (Figure 5, Item 1).
2. Attach four flange nuts (Figure 5, Item 4) loosely to charge air cooler permanent screws (Figure 5, Item 2) in cooler support panel (Figure 5, Item 1).
3. Apply lubricating soap to inside of flexible tubes (Figure 6, Item 4 and Item 7) on both charge air cooler tubes (Figure 6, Item 5 and Item 6).



**Figure 4. Air Return From Turbocharger.**

4. Place hose clamp (Figure 6, Item 3) over air intake (upper) flexible tube (Figure 6, Item 4).
5. Place air intake (upper) flexible tube (Figure 6, Item 4) and charge air cooler tube (Figure 6, Item 5) onto air intake (upper) fitting (Figure 6, Item 2) on charge air cooler (Figure 6, Item 1).

### CAUTION

Take care not to over-tighten hose clamps on flexible tubes (Figure 6, Item 4 and Item 7). Failure to comply may cause damage to equipment.

6. Place and secure hose clamp (Figure 6, Item 3) over air intake (upper) flexible tube (Figure 6, Item 4) on charge air cooler (Figure 6, Item 1) at air intake (upper) fitting (Figure 6, Item 2).
7. Place hose clamp (Figure 6, Item 8) over air return (lower) flexible tube (Figure 6, Item 7).
8. Place air return (lower) flexible tube (Figure 6, Item 7) and charge air cooler tube (Figure 6, Item 6) onto air return (lower) fitting (Figure 6, Item 9) on charge air cooler (Figure 6, Item 1).
9. Place and secure hose clamp (Figure 6, Item 8) over air return (lower) flexible tube (Figure 6, Item 7) and charge air cooler air return (lower) fitting (Figure 6, Item 9).
10. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
11. Close generator set doors.
12. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
13. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).

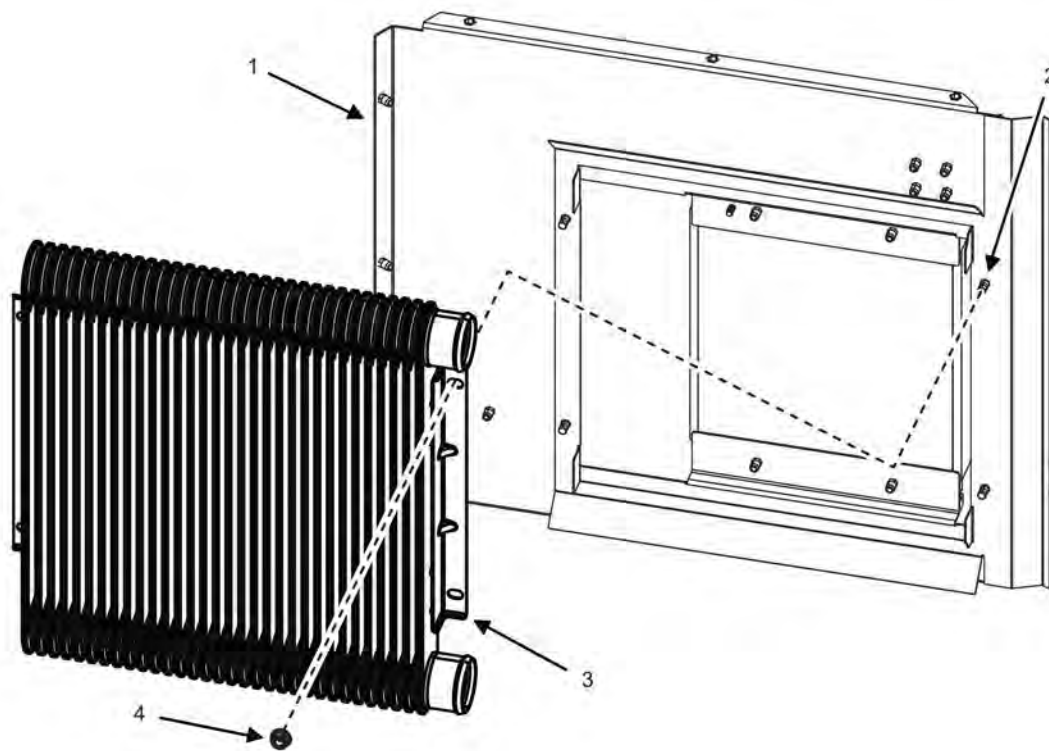


Figure 5. Charge Air Cooler — Installation.

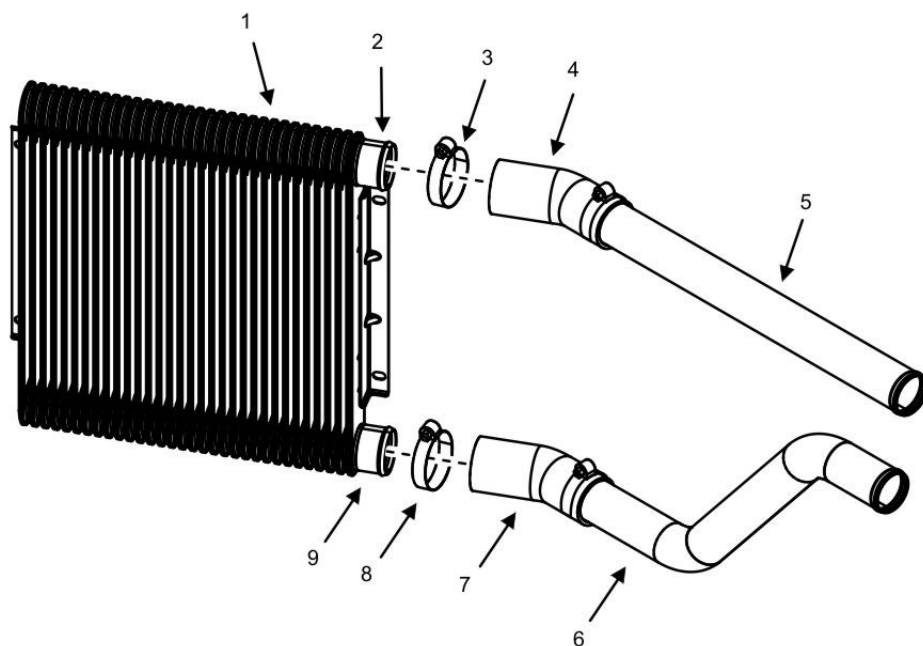


Figure 6. Charge Air Cooler Connections — Installation.

12. Repair as required.

END OF TASK



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**Remove Charge Air Cooler Airflow Tubes and Hoses**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove upper charge air cooler tube (Figure 4, Item 1) assembly:
  - a. Loosen hose clamp (Figure 4, Item 15) and remove flexible tube (Figure 4, Item 14) from upper fitting (Figure 4, Item 16) on charge air cooler (Figure 2, Item 8).
  - b. Loosen hose clamp (Figure 4, Item 2) securing upper charge air cooler tube (Figure 4, Item 1) to connector tube (Figure 4, Item 3).
  - c. Remove screw (Figure 4, Item 12) securing upper charge air cooler tube (Figure 4, Item 1) to interior body panel.
  - d. Remove flexible tube (Figure 4, Item 14), upper charge air cooler tube (Figure 4, Item 1), and hose clamps (Figure 4, Items 13 and 15) from unit and place on a suitable work surface.
  - e. Loosen and slide hose clamp (Figure 4, Item 8) securing connector tube (Figure 4, Item 7) to hose (Figure 4, Item 9) on turbocharger (Figure 4, Item 11).
  - f. Remove connector tube (Figure 4, Item 3), charge air cooler tube (Figure 4, Item 5), and hose clamps (Figure 4, Items 2, 4, 6, and 8) from unit and place on a suitable work surface.
  - g. Loosen hose clamp (Figure 4, Item 13) and remove flexible tube (Figure 4, Item 14) from upper charge air cooler tube (Figure 4, Item 1).
  - h. Loosen hose clamps (Figure 4, Items 4 and 6) and remove connector tubes (Figure 4, Items 3 and 7) from charge air cooler tube (Figure 4, Item 5).
3. Remove lower charge air cooler tube (Figure 3, Item 1) assembly:
  - a. Loosen hose clamp (Figure 3, Item 9) and remove flexible tube (Figure 3, Item 8) from lower fitting (Figure 3, Item 10) on charge air cooler (Figure 2, Item 8).
  - b. Loosen and slide back hose clamp (Figure 3, Item 3) on air hose (Figure 3, Item 4).
  - c. Remove screw (Figure 3, Item 2) securing lower charge air cooler tube (Figure 3, Item 1) interior body panel.
  - d. Remove lower charge air cooler tube (Figure 3, Item 1) from air hose (Figure 3, Item 4).
  - e. Remove flexible tube (Figure 3, Item 8) and lower charge air cooler tube (Figure 3, Item 1) from unit and place on a suitable work surface.
  - f. Loosen and slide back hose clamp (Figure 3, Item 5) securing air hose (Figure 3, Item 4) to intake manifold (Figure 3, Item 6).
  - g. Remove air hose (Figure 3, Item 4) and clamps (Figure 3, Items 3 and 5) from unit and place on a suitable work surface.
  - h. Loosen and slide back hose clamp (Figure 3, Item 7) and remove flexible tube (Figure 3, Item 8) from lower charge air cooler tube (Figure 3, Item 1).
4. Inspect all parts for damage and replace as required.

**END OF TASK****Install Charge Air Cooler Airflow Tubes and Hoses**

1. Install lower charge air cooler tube (Figure 3, Item 1) assembly:
  - a. Position hose clamp (Figure 3, Item 5) and air hose (Figure 3 Item 4) to intake manifold (Figure 3, Item 6).
  - b. Align air hose (Figure 3, Item 4) to hole in interior body panel and finger-tighten hose clamp (Figure 3, Item 5).

- c. Install flexible tube (Figure 3, Item 8) and hose clamp (Figure 3, Item 7) to lower charge air cooler tube (Figure 3, Item 1).
  - d. Ensure proper orientation of flexible tube (Figure 3, Item 8) on lower charge air cooler tube (Figure 3, Item 1) and tighten hose clamp (Figure 3, Item 7).
  - e. Align flexible tube (Figure 3, Item 8) to lower fitting (Figure 3, Item 10) on charge air cooler (Figure 2, Item 8).
  - f. Align lower charge air cooler tube (Figure 3, Item 1) to hole in interior body panel.
  - g. Install flexible tube (Figure 3, Item 8) to lower fitting (Figure 3, Item 10) and lower charge air cooler tube (Figure 3, Item 1) to air hose (Figure 3, Item 4). Finger-tighten hose clamps (Figure 3, Items 3 and 9).
  - h. Loosely install screw (Figure 3, Item 2) to secure lower charge air cooler tube (Figure 3, Item 1) to interior body panel.
  - i. Tighten hose clamps (Figure 3, Items 9 and 3).
2. Install upper charge air cooler tube (Figure 4, Item 1) assembly:
    - a. Position connector tubes (Figure 4, Items 3 and 7) and hose clamps (Figure 4, Items 4 and 6) on charge air cooler tube (Figure 4, Item 5).
    - b. Ensure proper orientation of connector tubes (Figure 4, Items 3 and 7) on charge air cooler tube (Figure 4, Item 5). Finger-tighten hose clamps (Figure 4, Items 4 and 6).
    - c. Align connector tube (Figure 4, Item 7) to hose (Figure 4, Item 9) on turbocharger (Figure 4, Item 11) and connector tube (Figure 4, Item 3) to hole in interior body panel.
    - d. Install connector tube (figure 4, Item 7) and hose clamp (Figure 4, Item 8) to hose (Figure 4, Item 9). Finger-tighten hose clamp (Figure 4, Item 8).
    - e. Install flexible tube (Figure 4, Item 14) and hose clamp (Figure 4, Item 13) to upper charge air cooler tube (Figure 4, Item 1).
    - f. Ensure proper orientation of flexible tube (Figure 4, Item 14) on upper charge air cooler tube (Figure 4, Item 1). Tighten hose clamp (Figure 4, Item 13).
    - g. Align flexible tube (Figure 4, Item 14) to upper fitting (Figure 4, Item 16) of charge air cooler (Figure 2, Item 8).
    - h. Align upper charge air cooler tube (Figure 4, Item 1) to hole in interior body panel and connector tube (Figure 4, Item 3).
    - i. Install flexible tube (Figure 4, Item 14) to upper fitting (Figure 4, Item 16) and upper charge air cooler tube (Figure 4, Item 1) to connector tube (Figure 4, Item 3). Finger-tighten hose clamps (Figure 4, Items 2 and 15).
    - j. Loosely install screw (Figure 4, Item 12) to secure upper charge air cooler tube (Figure 4, Item 1) to interior body panel.
    - k. Tighten hose clamps (Figure 3, Items 3 and 15).
3. Ensure proper seating of all hoses and tubes.
  4. Tighten screws (Figure 3, Item 2) (Figure 4, Item 12).

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**SERVICE COOLING SYSTEM**

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**INITIAL SETUP:****Test Equipment**

Test Kit, Radiator Pressure (WP 0179, Table 2, Item 24)

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Antifreeze, ethylene glycol (WP 0180, Expendable and Durable Items List, Item 2)

Cap set, protective (WP 0180, Item 8)

Cleaning compound, engine cooling system (WP 0180, Item 10)

Distilled water (WP 0180, Item 19)

Rag, wiping (WP 0180, Item 33)

**Personnel Required**

91D (1)

Assistant (1)

**References**

MIL-C-10597F (ME)

WP 0025, Remove/Install Radiator Hose and Tube Assemblies

WP 0028, Remove/Install Radiator Assembly

WP 0094, Lubrication Instructions

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Top body panel removed (WP 0029, Remove/Install Top Body Panel)

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**SERVICE COOLING SYSTEM****WARNING**

- Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.
- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.

## Test Cooling System

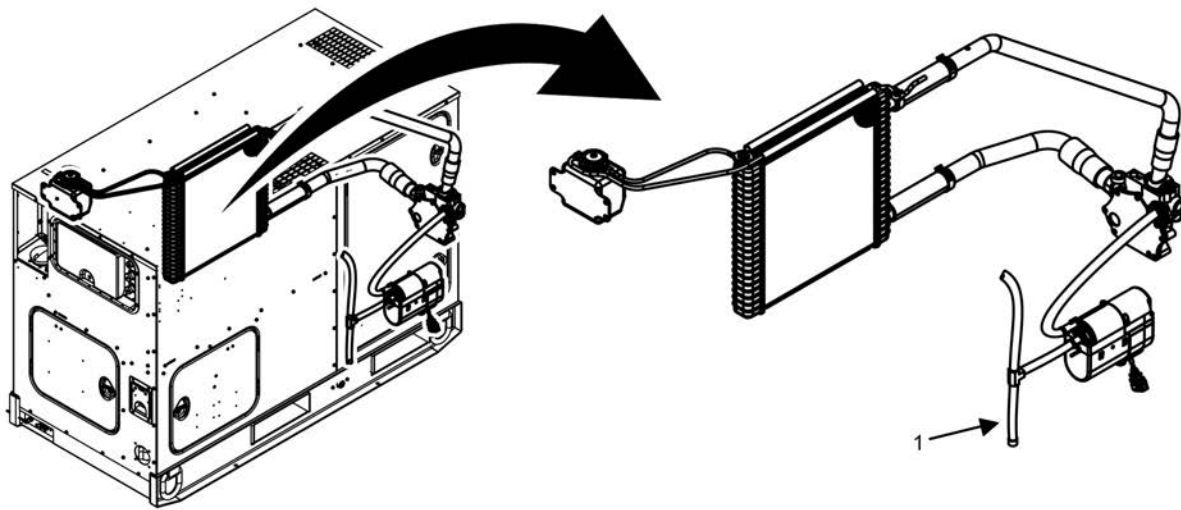
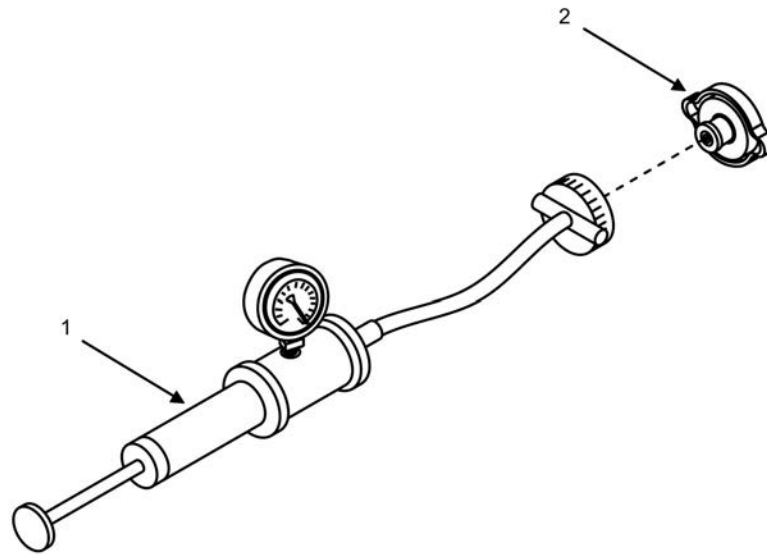


Figure 1. Cooling System — Location.

### NOTE

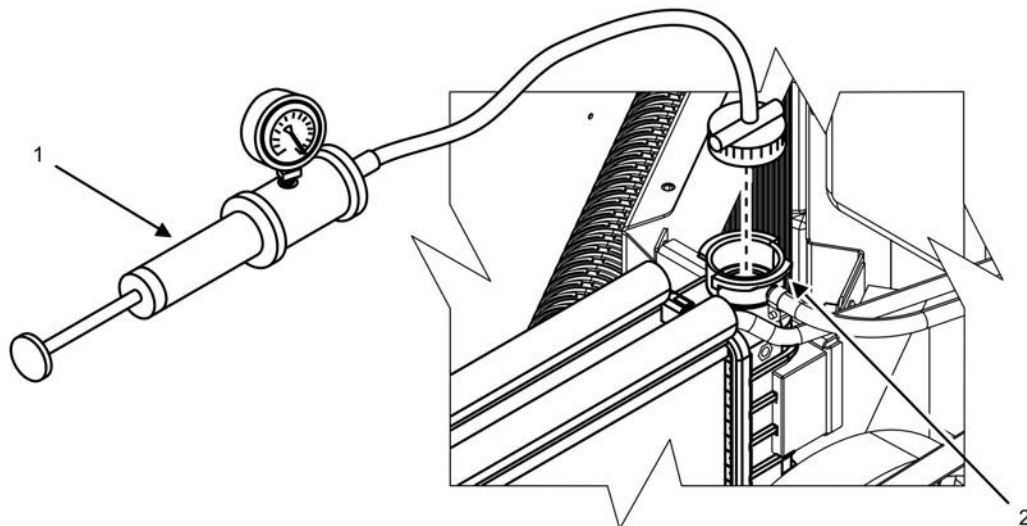
Dispose of captured coolant IAW local SOP.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Ensure radiator is properly filled. See Fill Radiator with Engine Coolant task.
3. Locate coolant drain hose (Figure 1, Item 1).



**Figure 2. Cooling System Test — Cap.**

4. Remove radiator cap (Figure 2, Item 2).
5. Install radiator cap (Figure 2, Item 2) onto cooling system tester (Figure 2, Item 1).
6. Apply 13 – 17 psi (89 – 117 kPa) to radiator cap (Figure 2, Item 2).
7. Replace radiator cap (Figure 2, Item 2) if relief valve fails to open when pressure is above 15 psi (103 kPa).
8. Remove radiator cap (Figure 2, Item 2) from cooling system tester (Figure 2, Item 1).



**Figure 3. Cooling System Test — Radiator.**

9. Install cooling system tester (Figure 3, Item 1) to radiator fill port (Figure 3, Item 2) on top of radiator.

---

**CAUTION**

Cooling system testing pressure must be no higher than 20 psi (138 kPa) to prevent damage to the water pump seal. Failure to comply may cause damage to equipment.

10. Apply no more than 20 psi (138 kPa) of pressure with cooling system tester (Figure 3, Item 1) through radiator fill port (Figure 3, Item 2).

**NOTE**

If pressure reading drops when pressure is applied to the radiator, the engine cooling system is leaking. Check all parts of cooling system to determine location of the leak.

11. Inspect cooling system for leaks in radiator hoses and around hose clamps (WP 0025, Remove/Install Radiator Hose and Tube Assemblies) if pressure reading drops after applying pressure through radiator fill port (Figure 3, Item 2).
12. Remove and replace radiator (not shown) if leaking (WP 0028, Remove/Install Radiator Assembly).
13. Remove and replace hoses or hose clamps (WP 0025, Remove/Install Radiator Hose and Tube Assemblies) where leaks are found.
14. Remove cooling system tester (Figure 3, Item 1) from fill port (Figure 3, Item 2).

**CAUTION**

If radiator cap (Figure 4, Item 4) is improperly closed, coolant may leak, causing engine to overheat. Be sure to close radiator cap (Figure 4, Item 4) securely. Failure to comply may cause damage to equipment.

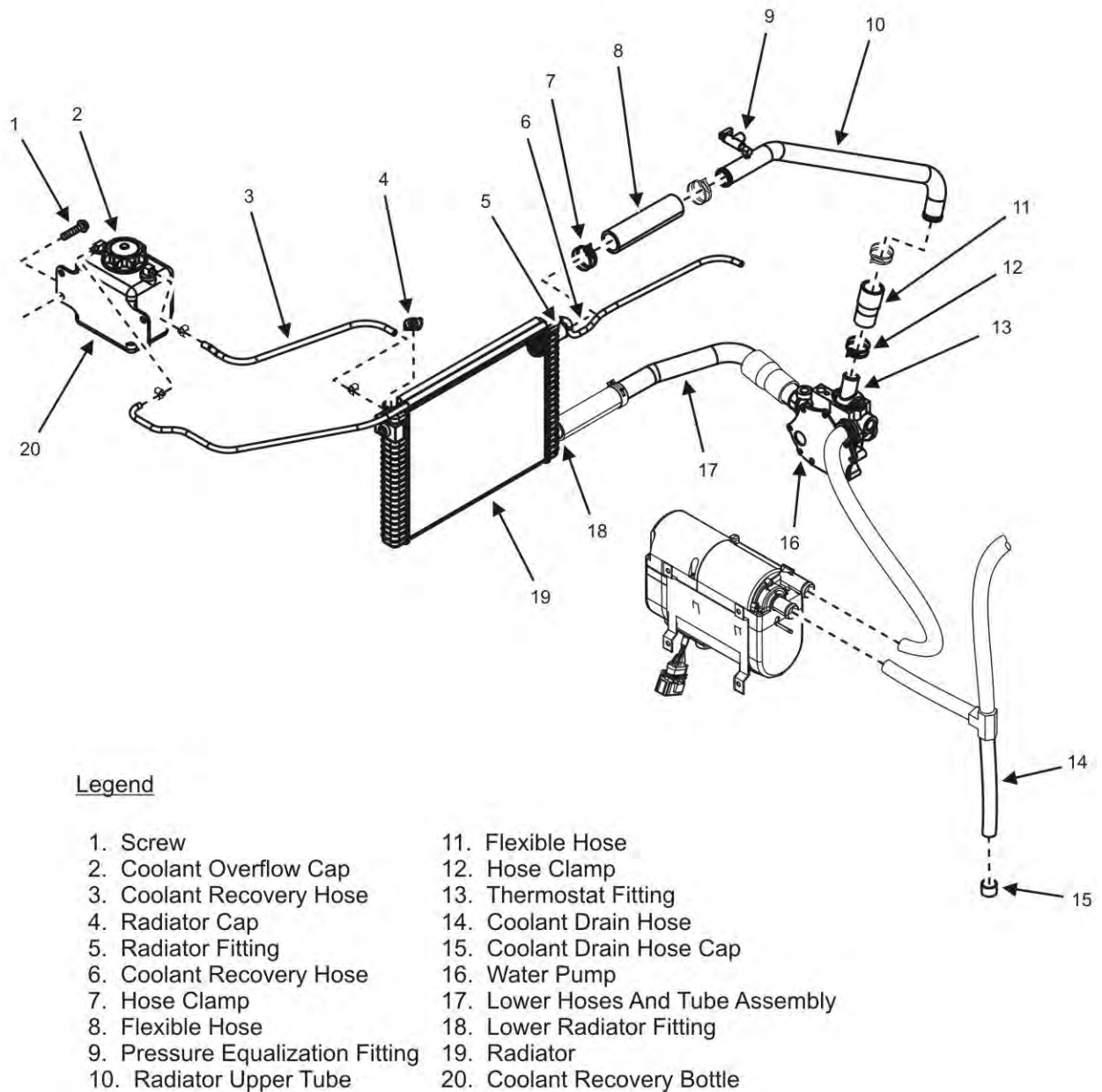
15. Install radiator cap (Figure 2, Item 2) to radiator fill port (Figure 3, Item 2).

**END OF TASK****Drain Engine Coolant****NOTE**

The AMMPS 30 kW generator set is shipped from the factory filled with commercial-grade coolant. The color of the commercial-grade coolant may be different from the Mil-Standard coolant with which you are familiar.

The commercial-grade coolant is compatible with the Mil-Standard coolant specified in this manual. Mil-Standard coolant may be used to top-off coolant level prior to the first maintenance interval. Commercial-grade coolant should be drained and replaced with Mil-Standard coolant as directed at the first maintenance interval.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door of unit.



**Figure 4. Cooling System.**

3. Drain coolant from engine:
  - a. Pull coolant drain hose (Figure 4, Item 14) through door opening.
  - b. Remove radiator cap (Figure 4, Item 4).

**NOTE**

Dispose of captured coolant IAW local SOP.

- c. Place a suitable container (minimum 5-gal capacity) under end of coolant drain hose (Figure 4, Item 14).

- d. Remove coolant drain hose cap (Figure 4, Item 15) from end of coolant drain hose (Figure 4, Item 14) and allow coolant to drain into container.
  - e. Install coolant drain hose cap (Figure 4, Item 15) onto end of coolant drain hose (Figure 4, Item 14) when coolant flow has stopped.
  - f. Store coolant drain hose (Figure 4, Item 14) inside unit.
4. Remove radiator flexible hoses and tube:
- a. Place a suitable container (minimum 1-gal capacity) beside flexible hose (Figure 4, Item 11) at thermostat fitting (Figure 4, Item 13).
  - b. Disengage hose clamp (Figure 4, Item 12) securing flexible hose (Figure 4, Item 11) to thermostat fitting (Figure 4, Item 13).
  - c. Remove flexible hose (Figure 4, Item 11) from thermostat fitting (Figure 4, Item 13) and allow coolant to drain into container.
  - d. Drain coolant from radiator upper tube (Figure 4, Item 10) by bending flexible hose (Figure 4, Item 8) at upper radiator fitting (Figure 4, Item 5) while holding container under open end of flexible hose (Figure 4, Item 11).
  - e. Disengage hose clamp (Figure 4, Item 7) securing flexible hose (Figure 4, Item 8) to upper radiator fitting (Figure 4, Item 5).
  - f. Remove flexible hose (Figure 4, Item 8) from upper radiator fitting (Figure 4, Item 5) (WP 0025, Remove/Install Radiator Hose and Tube Assemblies).
  - g. Remove radiator flexible hoses and tube (Figure 4, Items 8, 10, and 11) from unit and place on a suitable work surface.
  - h. Remove long coolant recovery hose (Figure 4, Item 6) from pressure equalization fitting (Figure 4, Item 9) on radiator upper tube (Figure 4, Item 10).
  - i. Remove short coolant recovery hose (Figure 4, Item 3) from fitting beneath radiator cap (Figure 4, Item 4).
  - j. Cap/plug openings in radiator (Figure 4, Item 19), thermostat fitting (Figure 4, Item 13), and coolant recovery hoses (Figure 4, Item 3 and Item 6) to prevent dirt and debris from entering cooling system.
  - k. Repeat step 4a thru step 4f to remove radiator lower hoses and tube assembly (Figure 4, Item 17) and place on a suitable work surface
5. Inspect and install radiator flexible hoses and tube:
- a. Remove residual coolant from upper radiator fitting (Figure 4, Item 5) with scale removing compound and wiping rag.
  - b. Inspect radiator flexible hoses and tube (Figure 4, Items 8, 10, and 11) for damage, deterioration, and/or obstruction.
  - c. Remove any obstructions in flexible hoses (Figure 4, Items 8 and Item 11) or radiator upper tube (Figure 4, Item 10), and replace damaged radiator upper tube (Figure 4, Item 10) or damaged flexible hoses (Figure 4, Item 8 and Item 11) as required.
  - d. Repeat steps a through c for radiator lower hoses and tube assembly (Figure 4, Item 17) connected to lower radiator fitting (Figure 4, Item 18) and engine water pump (Figure 4, Item 16), and repair or replace as required.
  - e. Inspect all hose clamps for excessive corrosion or signs of damage, and replace as required.
  - f. Remove all caps/plugs from fittings.
  - g. Install radiator flexible hoses and tube (Figure 4, Items 8, 10, and 11) to upper radiator fitting (Figure 4, Item 5) and to thermostat fitting (Figure 4, Item 13) (WP 0025, Remove/Install Radiator Hose and Tube Assemblies).



- 
6. Inspect and clean coolant recovery bottle
    - a. Place suitable container and wiping rag by coolant recovery bottle (Figure 4, Item 20).
    - b. Remove two coolant recovery hoses (Figure 4, Item 3 and Item 6) from top of coolant recovery bottle (Figure 4, Item 20) and drain into suitable container.
    - c. Cap/plug openings in coolant recovery hoses (Figure 4, Item 3 and Item 6).
    - d. Remove four screws (Figure 4, Item 1) securing coolant recovery bottle (Figure 4, Item 20) to fuel system panel (not shown) behind fuel filler cap.
    - e. Inspect screws (Figure 4, Item 1) for damage and replace if required. .
    - f. Remove coolant recovery bottle (Figure 4, Item 20) and discard coolant IAW local SOP.
    - g. Clean coolant recovery bottle (Figure 4, Item 20).
    - h. Inspect coolant recovery bottle (Figure 4, Item 20) for cracks or other damage, and replace as required.
    - i. Install coolant recovery bottle (Figure 4, Item 20) to fuel system panel (not shown) behind fuel filler cap using four new screws (Figure 4, Item 1).
    - j. Install long and short coolant recovery hoses (Figure 4, Item 3 and Item 6) to coolant recovery bottle (Figure 4, Item 20) using hose clamps.
    - k. Install coolant recovery bottle cap (Figure 4, Item 2) and secure tightly.
  7. Install radiator cap (Figure 4, Item 4) and secure tightly.
  8. Complete Clean Radiator Interior task, followed by Fill Radiator with Engine Coolant task if radiator requires flushing.
  9. Move to Fill Radiator with Engine Coolant task if radiator (Figure 4, Item 19) does not require flushing.

**END OF TASK**

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**Clean Radiator Interior****WARNING**

- Engine cooling system cleaning compound MIL-C-10597F (ME) Cleaning Compound with Conditioner for Engine Cooling Systems will not be used as a routine maintenance procedure each time antifreeze is added or drained from the cooling system. The compound will be used only when necessary to clean heavily rusted or partially clogged cooling systems. Failure to comply may cause injury or death to personnel.
- Engine cleaning compound MIL-C-10597F (ME) for cooling systems is designed to clean the interiors of cooling systems, to neutralize residual cleaning acids, and to coat the interiors with a silicate. Failure to comply may cause injury or death to personnel.

**NOTE**

The AMMPS 30 kW generator set is shipped from the factory filled with commercial-grade coolant. The color of the commercial-grade coolant may be different from the Mil-Standard coolant with which you are familiar.

The commercial-grade coolant is compatible with the Mil-Standard coolant specified in this manual. Therefore, Mil-Standard coolant may be used to top-off coolant level prior to the first maintenance interval. Commercial-grade coolant should be drained and replaced with Mil-Standard coolant as directed at the first maintenance interval.

Dispose of captured coolant IAW local SOP.

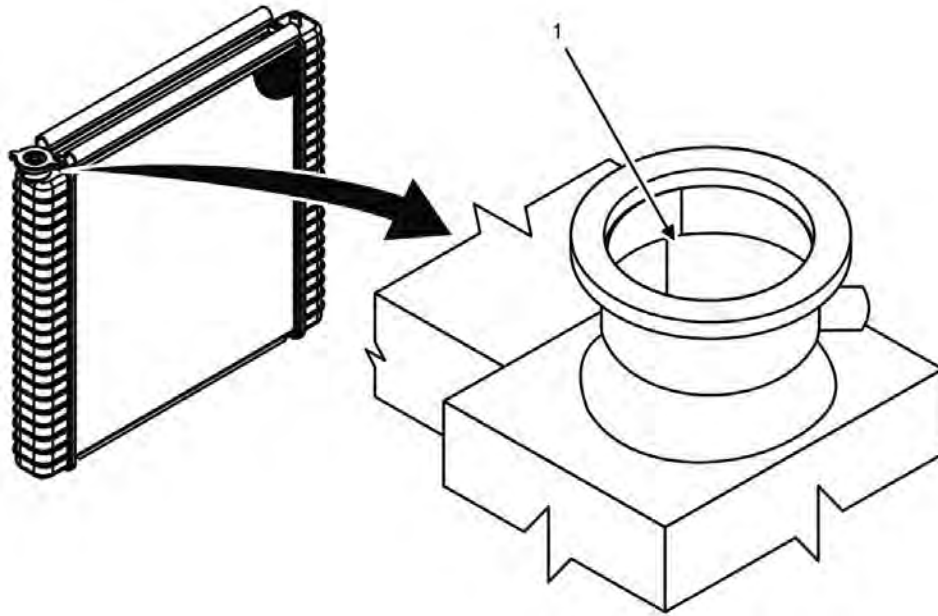
1. Drain engine coolant if not already drained. See Drain Engine Coolant task.
2. Fill radiator (Figure 4, Item 19) with proper amount of clean water (IAW cooling system capacity).
3. Start generator set and run to operating temperature 200°F (93°C) (TM 9-6115-752-10).
4. Shut down generator set and allow engine to cool (TM 9-6115-752-10).
5. Drain cooling system. See Drain Engine Coolant task.
6. Fill radiator again with proper amount of clean water (IAW cooling system capacity).
7. Remove radiator cap (Figure 4, Item 4).
8. Start generator set (TM 9-6115-752-10).

**CAUTION**

Water must be poured into radiator fill port at the same rate that it exits the system. Distilled water should be used to avoid mineral deposits in cooling system. Failure to comply will cause damage to engine.

9. Remove cap (Figure 4, Item 15) from end of coolant drain hose (Figure 4, Item 14) and allow water to drain to proper container IAW SOP while pouring fresh distilled water into the radiator filler neck (Figure 5, Item 1) at the same rate that it exits the cooling system.
10. Continue step 9 until the water being drained from the cooling system appears to be clear and free of debris.
11. Shut down generator set and allow all remaining water to drain out (TM 9-6115-752-10).
12. Fill cooling system with proper mix and level of coolant. See Fill Radiator With Engine Coolant task.

**END OF TASK**

**Fill Radiator with Engine Coolant****Figure 5. Radiator Fill Port.****NOTE**

The AMMPS 30 kW generator set is shipped from the factory filled with commercial-grade coolant. The color of the commercial-grade coolant may be different from the Mil-Standard coolant with which you are familiar.

The commercial-grade coolant is compatible with the Mil-Standard coolant specified in this manual. Mil-Standard coolant may be used to top-off coolant level prior to the first maintenance interval. Commercial-grade coolant should be drained and replaced with Mil-Standard coolant as directed at the first maintenance interval.

1. Remove radiator cap (Figure 4, Item 4) from radiator (Figure 4, Item 19).
2. Open pressure equalization valve on radiator upper tube (Figure 4, Item 10) assembly by lifting the equalization valve lever 90 degrees from position shown.

**NOTE**

Pour coolant slowly into the radiator to allow trapped air to escape.

3. Fill radiator (Figure 4, Item 19) with approved mixture of one-half clean water and one-half engine coolant until coolant level reaches narrow opening at the bottom of the filler neck (Figure 5, Item 1). See WP 0094, Lubrication Instructions.

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## CAUTION

Be sure to close radiator cap (Figure 4, Item 4) securely. If cap is improperly closed, coolant may leak, causing engine to overheat. Failure to comply may cause damage to equipment.

4. Install radiator cap (Figure 4, Item 4) and tighten securely.
5. Remove coolant recovery bottle cap (Figure 4, Item 2) from coolant recovery bottle (Figure 4, Item 20). Fill coolant recovery bottle (Figure 4, Item 20) with coolant mixture up to level of LOW marking line on fuel system panel behind fuel filler cap.
6. Install coolant recovery bottle cap (Figure 4, Item 2) securely on coolant recovery bottle (Figure 4, Item 20).
7. Return pressure equalization valve lever to original position.
8. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
9. Close generator set doors.
10. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
11. Start engine and run for 5 min (TM 9-6115-752-10).
12. Stop engine and let cool (TM 9-6115-752-10).
13. Open right-side door and remove negative ground cable from right-hand battery (WP 0037, Remove/Install Batteries).
14. Check coolant level in coolant recovery bottle (Figure 4, Item 20) and add coolant mixture as required to bring level of coolant in coolant recovery bottle (Figure 4, Item 20) to COOL indicator on fuel system panel (not shown) behind coolant recovery bottle (Figure 4, Item 20).

## CAUTION

Be sure to close radiator cap securely. If cap is loose or improperly closed, coolant may leak, causing engine to overheat. Failure to comply may cause damage to equipment.

If radiator cap (Figure 4, Item 4) is improperly closed, coolant may leak, causing engine to overheat. Be sure to close radiator cap (Figure 4, Item 4) securely. Failure to comply may cause damage to equipment.

15. Install top body panel (WP 0029, Remove/Install Top Body Panel).
16. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
17. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
18. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
19. Inspect cooling system for leaks.
20. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL COOLANT RECOVERY SYSTEM**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Hose, vent (WP 0115, Repair Parts List, Figure 10, Item 18)

Hose, vent (WP 0115, Figure 10, Item 23)

Tank, coolant (WP 0115, Figure 10, Item 19)

Antifreeze, ethylene glycol (WP 0180, Expendable and Durable Items List, Item 2)

Cap set, protective (WP 0180, Item 8)

Distilled water (WP 0180, Item 19)

Pan, drain (WP 0180, Item 30)

Rag, wiping (WP 0180, Item 33)

**Personnel Required**

91D (1)

Assistant (1)

**References**

WP 0022, Service Cooling System

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

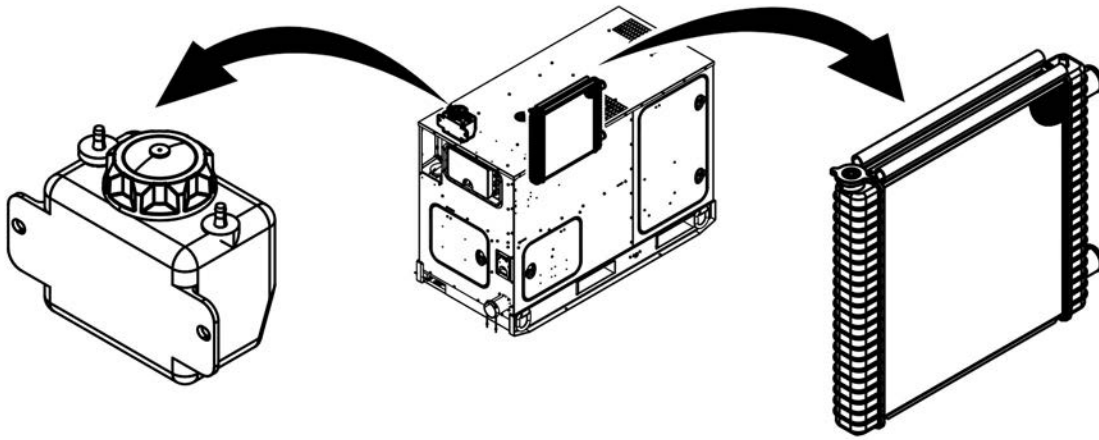
Top body panel removed (WP 0029, Remove/Install Top Body Panel)

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**REMOVE/INSTALL COOLANT RECOVERY SYSTEM****WARNING**

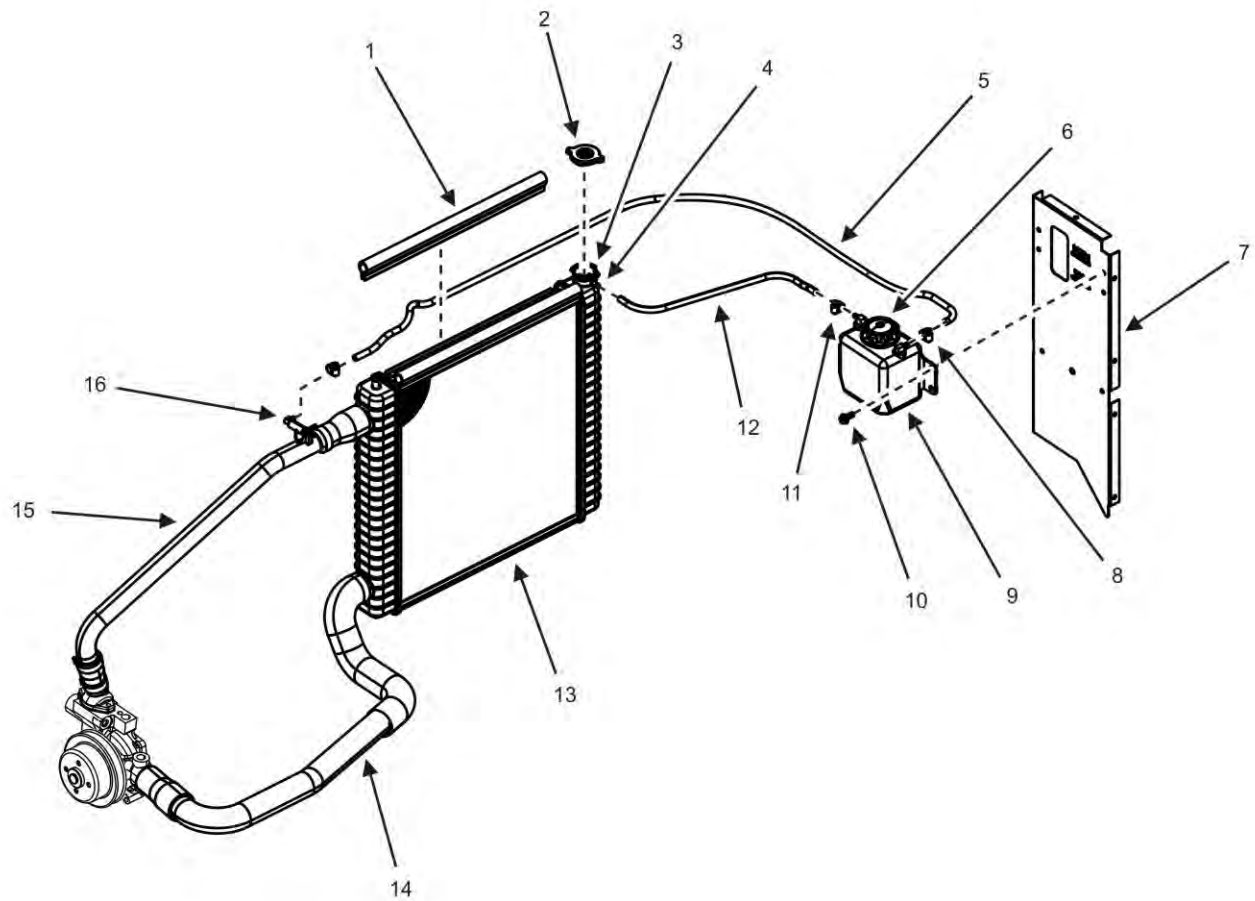
- Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.
- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.

## Remove Coolant Recovery System



**Figure 1. Coolant Recovery System — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate radiator (Figure 1) and coolant tank (Figure 1) inside unit.



Legend

- |                          |   |
|--------------------------|---|
| 1. Rubber Edge Bulb Seal | 9. Coolant Tank                         |
| 2. Radiator Cap          | 10. Screw                               |
| 3. Radiator Fill Opening | 11. Hose Clamp                          |
| 4. Overflow Fitting      | 12. Short Vent Hose                     |
| 5. Long Vent Hose        | 13. Radiator                            |
| 6. Cap                   | 14. Lower Radiator Tube                 |
| 7. Fuel System Panel     | 15. Upper Radiator Tube                 |
| 8. Hose Clamp            | 16. Pressure Equalization Valve Fitting |

**Figure 2. Coolant Recovery System.**

3. Place wiping rag over radiator cap (Figure 2, Item 2).
4. Turn radiator cap (Figure 2, Item 2) gently counterclockwise to first click to relieve residual pressure in cooling system.
5. Turn radiator cap (Figure 2, Item 2) counterclockwise to second click after pressure is relieved.
6. Remove radiator cap (Figure 2, Item 2) and cover radiator fill opening (Figure 2, Item 3).
7. Inspect radiator cap (Figure 2, Item 2) for damage or cracked gasket, and replace as required.

---

**NOTE**

Cap/plug all open coolant lines/fittings to prevent dirt and debris from entering the cooling system.

Dispose of captured coolant IAW local SOP.

8. Loosen and slide hose clamps (Figure 2, Items 8 and 11) on long and short vent hoses (Figure 2, Item 5 and Item 12) away from coolant tank (Figure 2, Item 9).
9. Remove long and short vent hoses (Figure 2, Item 5 and Item 12) from fittings on top of coolant tank (Figure 2, Item 9).
10. Remove four screws (Figure 2, Item 10) securing coolant tank (Figure 2, Item 9) to fuel system panel (Figure 2, Item 7) behind fuel filler neck.
11. Remove coolant tank (Figure 2, Item 9) from unit and place on a suitable work surface.

**NOTE**

Information label (not shown) attaches to pressure equalization valve fitting (Figure 2, Item 16) on upper radiator tube (Figure 2, Item 15). When removing long vent hose (Figure 2, Item 5), take care not to lose information label.

12. Remove long vent hose (Figure 2, Item 5) from pressure equalization valve fitting (Figure 2, Item 16) on upper radiator tube (Figure 2, Item 15).
13. Remove rubber edge bulb seal (Figure 2, Item 1) containing long vent hose (Figure 2, Item 5) from top of radiator (Figure 2, Item 13) and extract long vent hose (Figure 2, Item 5) from inside rubber edge bulb seal (Figure 2, Item 1).
14. Remove hose clamp (not shown) connecting short vent hose (Figure 2, Item 12) to overflow fitting (Figure 2, Item 4) beneath radiator cap (Figure 2, Item 2).
15. Remove short vent hose (Figure 2, Item 12) from unit and place on a suitable work surface.

**END OF TASK****Inspect Coolant Recovery System**

1. Inspect radiator (Figure 2, Item 13) for cracks around fill port, corrosion, or other damage, and replace as required.
2. Inspect radiator cap (Figure 1, Item 2) for cracks, broken gasket, or other damage, and replace as required.
3. Inspect hose clamps (Figure 2, Items 8 and 11) for damage, and replace as required.
4. Inspect coolant tank (Figure 2, Item 9) and cap (Figure 2, Item 6) for damage, and replace as required.
5. Inspect long and short vent hoses (Figure 2, Item 5 and Item 12) for damage, and replace as required.
6. Inspect upper radiator tube (Figure 2, Item 15) and lower radiator tube (Figure 2, Item 14) for cracks and damage, and replace individually as required.

**END OF TASK**



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**Install Coolant Recovery System****NOTE**

Wipe down hoses, parts, and connectors with wiping rag prior to installation.

1. Lubricate long and short vent hose (Figure 2, Item 5 and Item 12) fittings with coolant to facilitate future removal.
2. Position coolant tank (Figure 2, Item 9) to its mounting location on fuel system panel (Figure 2, Item 7) behind fuel filler neck.
3. Secure coolant tank (Figure 2, Item 9) to fuel system panel (Figure 2, Item 7) behind fuel filler neck by installing four screws (Figure 2, Item 10).

**NOTE**

Remove all caps/plugs from coolant lines prior to installation.

4. Install two hose clamps (Figure 2, Items 8 and 11) onto long and short vent hoses (Figure 2, Item 5 and Item 12) to be attached to coolant tank (Figure 2, Item 9).

**NOTE**

Long coolant vent hose (Figure 2, Item 5) connects the right-side of coolant tank to the pressure equalization valve fitting (Figure 2, Item 16). Short vent hose (Figure 2, Item 12) connects the brass fitting on the left-side of coolant tank to the overflow fitting (Figure 2, Item 4) beneath radiator cap (Figure 2, Item 2).

5. Connect long and short vent hoses (Figure 2, Item 5 and Item 12) to fittings on top of coolant tank (Figure 2, Item 9) and secure hose clamps (Figure 2, Items 8 and 11) on each fitting.
6. Place long vent hose (Figure 2, Item 5) through opening in rubber edge bulb seal (Figure 2, Item 1) until hose exits opposite end of seal.
7. Place free end of long vent hose (Figure 2, Item 5) through bulkhead (not shown) beside upper radiator hose and carefully pull hose through.
8. Attach rubber edge bulb seal (Figure 2, Item 1), with long vent hose (Figure 2, Item 5) inside, to top of radiator (Figure 2, Item 13), being careful not to damage long vent hose (Figure 2, Item 5).
9. Attach long vent hose (Figure 2, Item 5) to pressure equalization valve fitting (Figure 2, Item 16) on upper radiator tube (Figure 2, Item 15).
10. Attach short vent hose (Figure 2, Item 12) from coolant tank (Figure 2, Item 9) to overflow fitting (Figure 2, Item 4) beneath radiator fill opening (Figure 2, Item 3).
11. Place a mixture of one half distilled water and one half engine coolant into radiator (Figure 2, Item 13) until mixture covers fins inside radiator (WP 0022, Service Cooling System).
12. Install and secure radiator cap (Figure 2, Item 2).
13. Place a mixture of one half distilled water and one half engine coolant into coolant tank (Figure 2, Item 9) until mixture is level with COOL line on fuel system panel (Figure 2, Item 7) behind fuel filler neck (WP 0022, Service Cooling System).
14. Install and secure cap (Figure 2, Item 6) on coolant tank (Figure 2, Item 9).
15. Close generator set doors.

**NOTE**

Running the engine will reveal any leaks in the coolant recovery lines.

16. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
17. Start engine and run until fan cycles on and off two times (TM 9-6115-752-10).
18. Check for leaks at all coolant hose fittings.
19. Turn engine OFF (TM 9-6115-752-10).
20. Allow engine to cool.
21. Check coolant level and add coolant as required (WP 0022, Service Cooling System).
22. Install top body panel (WP 0029, Remove/Install Top Body Panel).

**NOTE**

Dispose of captured coolant IAW local SOP.

23. Close generator set doors.
24. Set engine control switch to PRIME & RUN (TM 9-6115-752-10)
25. Start engine and check for leaks and proper operation (TM 9-6115-752-10).
26. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**

---

**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL COOLING FANS**

---

**INITIAL SETUP:**

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Fan, engine, cooling (WP 0115, Repair Parts List, Figure 10, Item 42)

**Personnel Required**

91D (1)

Assistant (1)

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Top body panel removed (WP 0029, Remove/Install Top Body Panel)

Left-side body panel removed (WP 0032, Remove/Install Left-Side Body Panels)

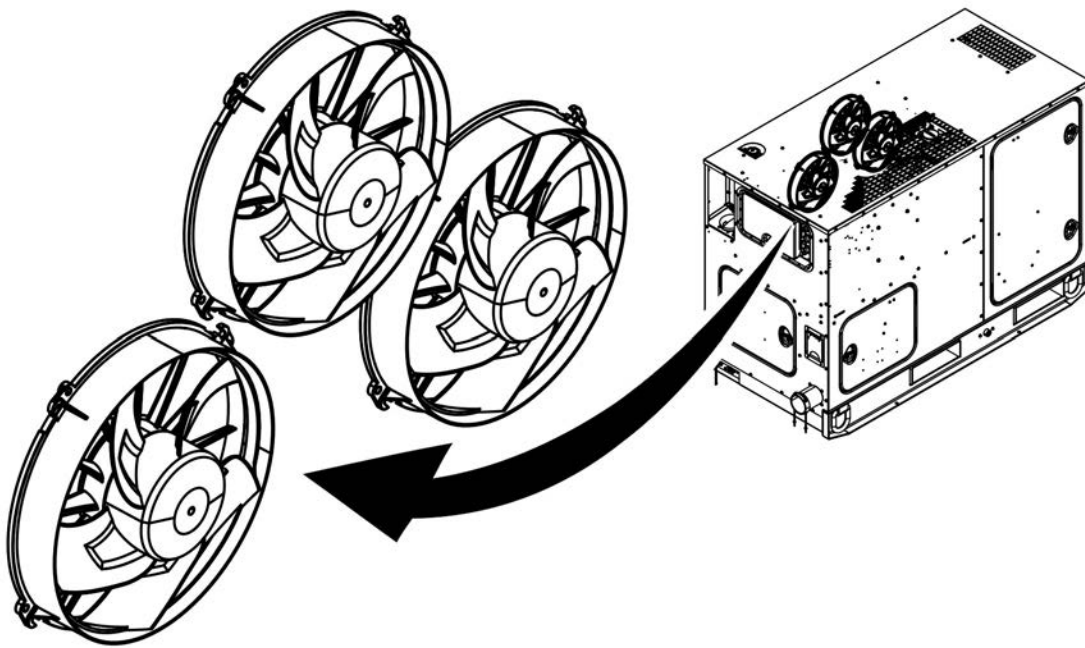
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**REMOVE/INSTALL COOLING FANS**

**WARNING**

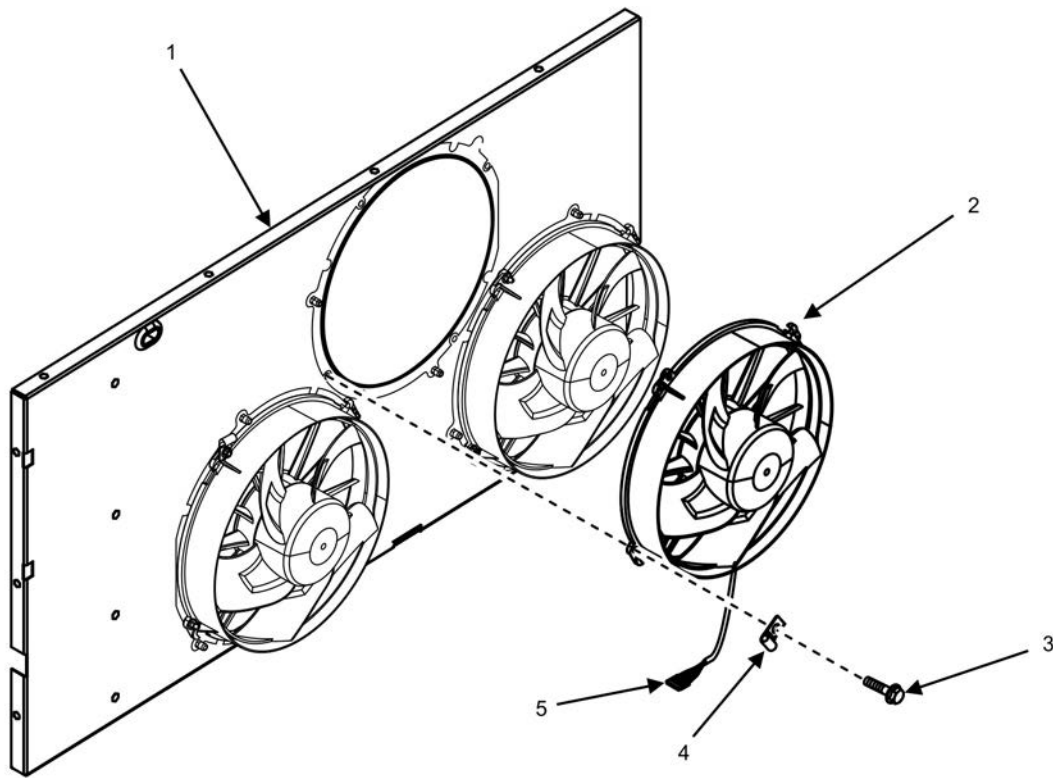
- Cooling fan has sharp blades. Use caution and wear gloves when removing or installing fans. Failure to comply may cause injury or death to personnel.
- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

## Remove Cooling Fan



**Figure 1. Cooling Fan — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate cooling fans (Figure 1).



**Figure 2. Cooling Fan — Details.**

3. Disconnect cooling fan electrical pigtail (Figure 2, Item 5) from unit wiring harness (not shown) at connector.

### NOTE

if necessary, fan inlet duct (Figure 3, Item 4) can be removed for better accessibility to cooling fan's four screws (Figure 2, Item 3) (see Remove Inlet Duct task).

One of the four screws (Figure 2, Item 3) removed in the following step also secures P-clamp (Figure 2, Item 4). Note location of P-clamp (Figure 2, Item 4) for installation.

4. Remove four screws (Figure 2, Item 3) securing cooling fan (Figure 2, Item 2) to fan support panel (Figure 2, Item 1).

### CAUTION

Handle fan carefully when removing from unit so as not to damage radiator. Failure to comply may cause damage to equipment.

5. Remove cooling fan (Figure 2, Item 2) from unit and place on a suitable work surface.
6. Remove dirt and debris from surfaces of cooling fan.
7. Perform steps 3 – 7 for any additional fans to be removed.

**END OF TASK**

---

**Inspect Cooling Fan**

1. Inspect cooling fan (Figure 2, Item 2) for damage to fan guard and fan blades, and replace cooling fan (Figure 2, Item 2) as required.
2. Inspect cooling fan electrical pigtail (Figure 2, Item 5) for cracked insulation, broken wires, or other damage, and replace cooling fan (Figure 2, Item 2) as required.
3. Inspect fan support panel (Figure 2, Item 1) for excessive corrosion or other damage. Replace as required.
4. Inspect screws (Figure 2, Item 3) for excessive corrosion or damage. Replace as required.

**END OF TASK****Install Cooling Fan**

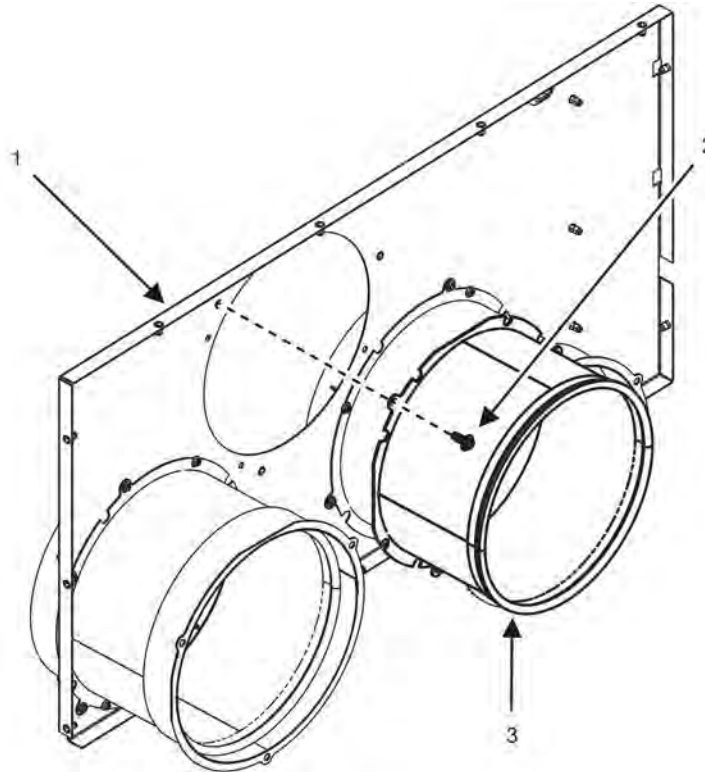
1. Position cooling fan (Figure 2, Item 2) on fan support panel (Figure 2, Item 1).
2. Ensure electrical pigtail (Figure 2, Item 5) is through P-clamp (Figure 2, Item 4).
3. Align cooling fan mounting holes with mounting holes in fan support panel (Figure 2, Item 1).

**NOTE**

One of the four screws (Figure 2, Item 3) installed in the following step also secures P-clamp (Figure 2, Item 4). Install P-clamp (Figure 2, Item 4) to noted location.

4. Secure cooling fan (Figure 2, Item 2) to fan support panel (Figure 2, Item 1) with four screws (Figure 2, Item 3).
5. Connect cooling fan electrical pigtail (Figure 2, Item 5) to unit wiring harness (not shown) at connector.
6. Repeat steps 1 – 5 for any additional fans to be installed.
7. Install inlet duct (Figure 3, Item 4) if removed. See Install Inlet Duct task.
8. Install left-side body panel (WP 0032, Remove/Install Left-Side Body Panels).
9. Install top body panel (WP 0029, Remove/Install Top Body Panel).
10. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
11. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
12. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
13. Allow cooling fans to cycle on and off through two cycles to check for proper operation.
14. Repair as required.

**END OF TASK**

**Remove Inlet Duct****Figure 3. Inlet Duct — Details.**

1. Remove four screws (Figure 3, Item 2) securing inlet duct (Figure 3, Item 3) to fan support panel (Figure 3, Item 1).
2. Remove inlet duct (Figure 3, Item 3) from unit and place on a suitable work surface.
3. Inspect inlet duct (Figure 3, Item 3) for obvious signs of damage and replace as required.

**END OF TASK****Install Inlet Duct**

1. Position inlet duct (Figure 3, Item 3) to fan support panel (Figure 3, Item 1).
2. Align inlet duct (Figure 3, Item 3) mounting holes with mounting holes in fan support panel (Figure 3, Item 1).
3. Secure inlet duct (Figure 3, Item 3) to fan support panel (Figure 3, Item 1) with four screws (Figure 3, Item 2).

**END OF TASK****END OF WORK PACKAGE**





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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL RADIATOR HOSE AND TUBE ASSEMBLIES**

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**INITIAL SETUP:**

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Hose, coolant (WP 0115, Repair Parts List, Figure 10, Item 26)  
Hose, coolant (WP 0115, Figure 10, Item 28)  
Hose, coolant (WP 0115, Figure 10, Item 30)  
Hose, coolant (WP 0115, Figure 10, Item 33)  
Hose, vent (WP 0115, Figure 10, Item 18)  
Tube, coolant, lower (WP 0115, Figure 10, Item 29)  
Tube, coolant, upper (WP 0115, Figure 10, Item 34)  
Antifreeze, ethylene glycol (WP 0180, Expendable and Durable Items List, Item 2)  
Cap set, protective (WP 0180, Item 8)  
Cleaning compound, engine cooling system (WP 0180, Item 10)  
Pan, drain (1) (WP 0180, Item 30)  
Rag, wiping (2) (WP 0180, Item 33)  
Sealant (WP 0180, Item 34)

**Personnel Required**

91D (1)  
Assistant (1)

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)  
Engine cool  
Battery ground cable removed (WP 0037, Remove/Install Batteries)  
Top body panel removed (WP 0029, Remove/Install Top Body Panel)  
Front body panel removed (WP 0030, Remove/Install Front Body Panel)

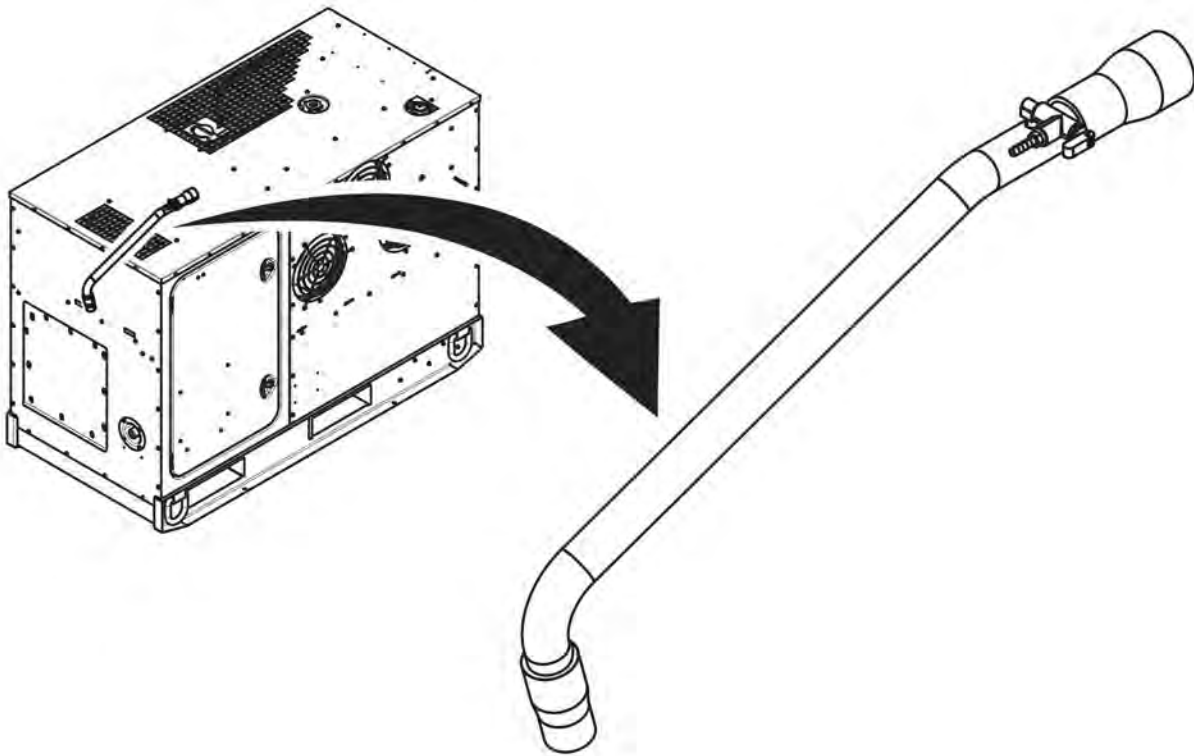
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**REMOVE/INSTALL RADIATOR HOSE AND TUBE ASSEMBLIES**

**WARNING**

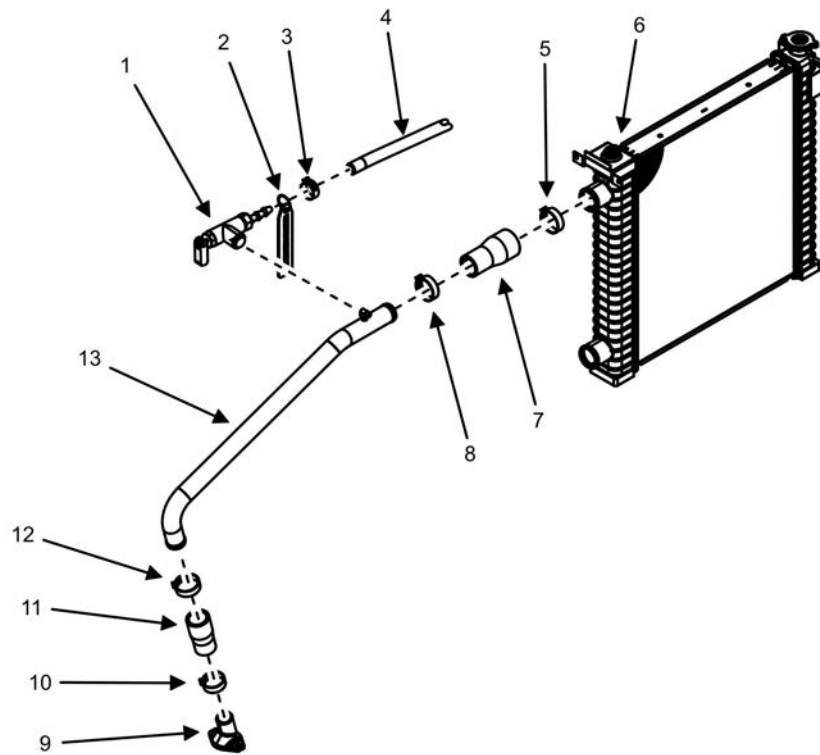
- Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.
- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.

## Remove Upper Radiator Hose and Tube Assembly



**Figure 1. Upper Radiator Hose Assembly — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate upper radiator hose assembly (Figure 1).



**Figure 2. Upper Radiator Hose Assembly.**

### NOTE

Place a suitable container or rags under each hose connection prior to removal to capture any residual coolant that may be spilled when hoses are removed.

Cap/plug all open coolant hoses, ports, and fittings to prevent additional spillage and to prevent contamination from entering the cooling system.

3. Loosen hose clamp (Figure 2, Item 3) and remove vent hose (Figure 2, Item 4) from equalization valve (Figure 2, Item 1) on upper coolant tube (Figure 2, Item 13).
4. Loosen hose clip (Figure 2, Item 10) at thermostat housing (Figure 2, Item 9) and remove hose (Figure 2, Item 11) from thermostat housing (Figure 2, Item 9).
5. Loosen hose clip (Figure 2, Item 5) at upper port of radiator (Figure 2, Item 6) and remove hose (Figure 2, Item 7) from radiator (Figure 2, Item 6).
6. Remove upper radiator hose assembly (Figure 1) from generator set and place on a suitable work surface.
7. Remove two hose clips (Figure 2, Items 5 and 8) and hose (Figure 2, Item 7) from radiator end of upper coolant tube (Figure 2, Item 13).
8. Remove two hose clips (Figure 2, Items 10 and 12) and hose (Figure 2, Item 11) from thermostat housing end of upper coolant tube (Figure 2, Item 13).
9. Remove equalization valve (Figure 2, Item 1) from upper coolant tube (Figure 2, Item 13).

**END OF TASK**

---

**Inspect Upper Radiator Hose and Tube Assembly**

1. Inspect hose clips (Figure 2, Items 5, 8, 10, and 12) and hose clamp (Figure 2, Item 3) for cracks, excessive corrosion, or other signs of obvious damage. Repair or replace as required.
2. Inspect hoses (Figure 2, Items 7 and 11) for firmness, cracks, wear, or other signs of obvious damage. Repair or replace as required.
3. Remove any scale from all hose ends with scale-removing compound and wiping rag prior to installation.
4. Inspect upper coolant tube (Figure 2, Item 13) for cracks, damage, or excessive corrosion. Replace as required.
5. Inspect upper port of radiator (Figure 2, Item 6) for damage and corrosion. Replace radiator (Figure 2, Item 6) if damage or corrosion are found (WP 0028, Remove/Install Radiator Assembly).

**END OF TASK****Install Upper Radiator Hose and Tube Assembly**

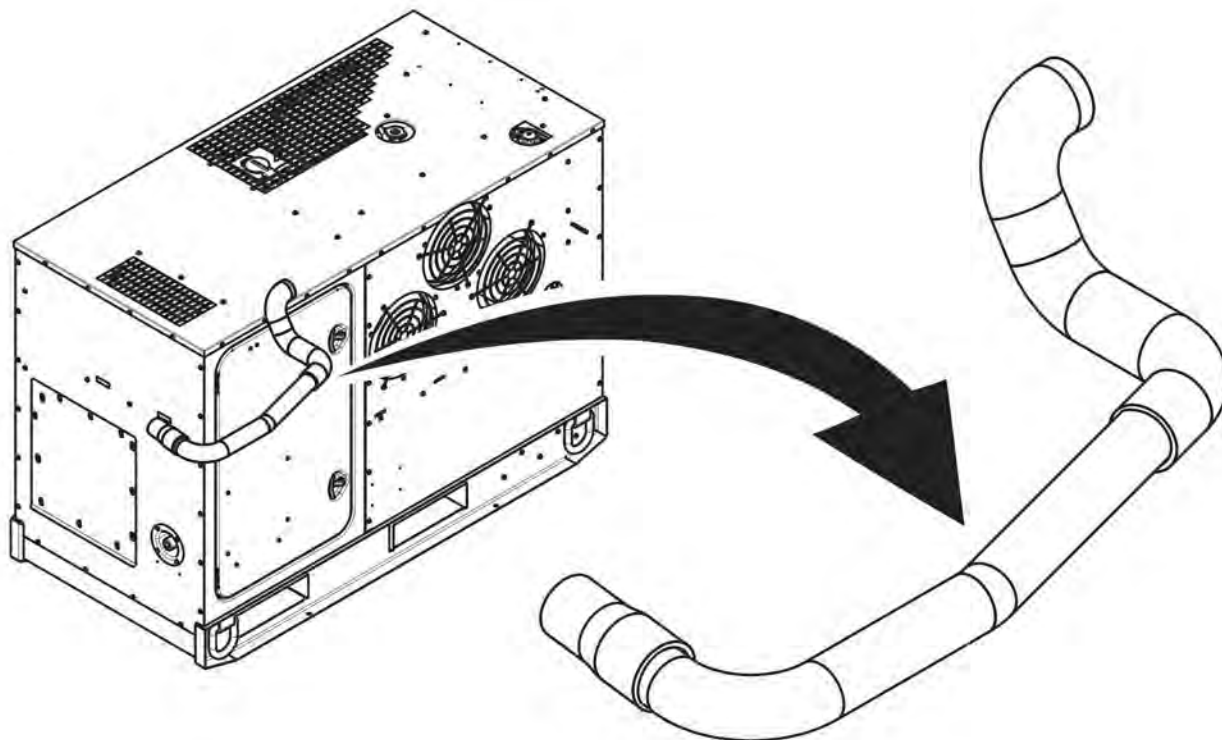
1. Wipe down all components with a wiping rag prior to installation.
2. Install hose (Figure 2, Item 7) and two hose clips (Figure 2, Items 5 and 8) to radiator end of upper coolant tube (Figure 2, Item 13).
3. Install hose (Figure 2, Item 11) and two hose clips (Figure 2, Items 10 and 12) to thermostat housing end of upper coolant tube (Figure 2, Item 13).
4. Apply thread sealing compound to threads of pressure equalization valve (Figure 2, Item 1) and install pressure equalization valve (Figure 2, Item 1) to upper coolant tube (Figure 2, Item 13).
5. Position upper radiator hose assembly (Figure 1) to its mounting location in generator set and secure by installing hose (Figure 2, Item 7) to upper port of radiator (Figure 2, Item 6) and hose (Figure 2, Item 11) to thermostat housing (Figure 2, Item 9). Secure by installing hose clips (Figure 2, Items 5, 8, 10, and 12) to their final locations.

**CAUTION**

Over-tightened hose clamps may cause hoses to crack and leak. Failure to comply may cause damage to equipment.

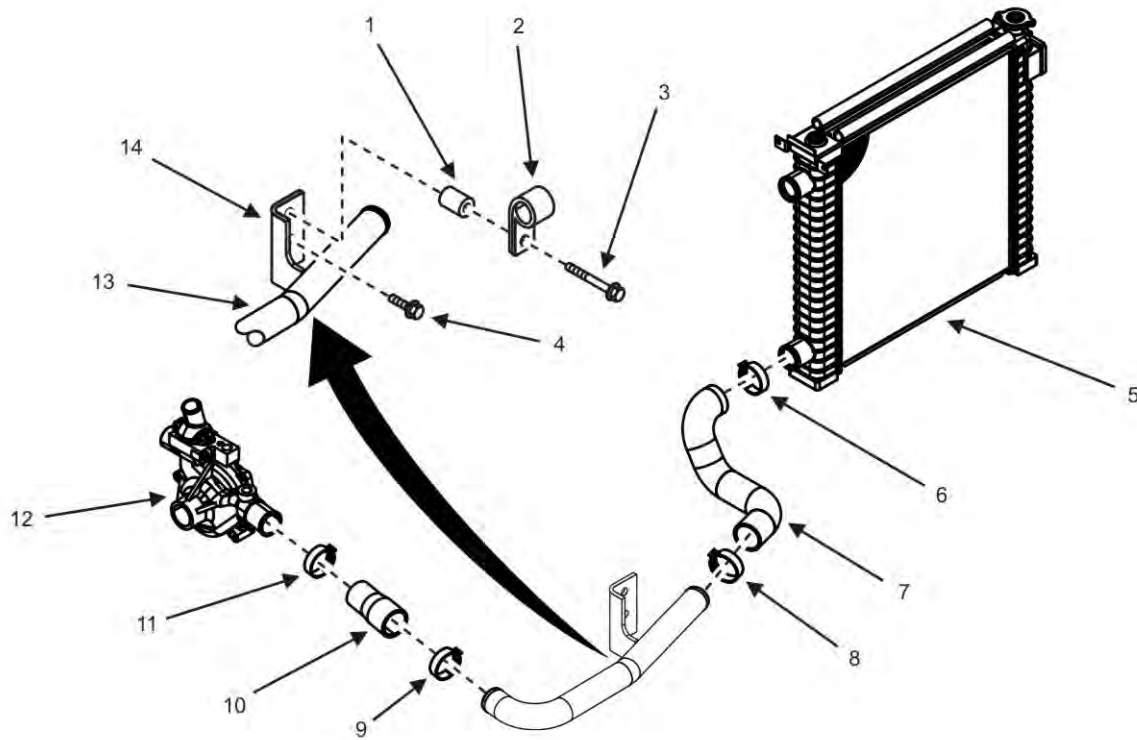
6. Install hose (Figure 2, Item 4) to pressure equalization valve (Figure 2, Item 1) and secure by installing hose clamp (Figure 2, Item 3).
7. Fill radiator with engine coolant (WP 0022, Service Cooling System).
8. Install front body panel (WP 0030, Remove/Install Front Body Panel).
9. Install top body panel (WP 0029, Remove/Install Top Body Panel).
10. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
11. Close generator set doors.
12. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
13. Start engine and check for coolant leaks and proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
14. Repair as required.

**END OF TASK**

**Remove Lower Radiator Hose and Tube Assembly**

**Figure 3. Lower Radiator Hose Assembly — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate lower radiator hose assembly (Figure 3).



**Figure 4. Lower Radiator Hose Assembly.**

### NOTE

Prior to removal, place a suitable container or rags under each hose connection to capture any residual coolant that may be spilled when hoses are removed.

To prevent additional spillage and contamination from entering the cooling system, cap/plug all open coolant hoses, ports, and fittings.

3. Loosen hose clip (Figure 4, Item 11) at water pump (Figure 4, Item 12) and remove hose (Figure 4, Item 10) from water pump (Figure 4, Item 12).
4. Loosen hose clip (Figure 4, Item 6) at lower port of radiator (Figure 4, Item 5) and remove hose (Figure 4, Item 7) from radiator (Figure 4, Item 5).
5. Remove screw (Figure 4, Item 3) that secures P-clamp (Figure 4, Item 2) and spacer (Figure 4, Item 1) to bracket (Figure 4, Item 14) of lower coolant tube (Figure 4, Item 13). Allow P-clamp (Figure 4, Item 2) and its wiring harness to remain inside generator set.
6. Remove screw (Figure 4, Item 4) that secures bracket of lower coolant tube (Figure 4, Item 13) to engine.
7. Remove lower radiator hose assembly (Figure 3) from generator set and place on a suitable work surface.
8. Remove two hose clips (Figure 4, Items 6 and 8) and hose (Figure 4, Item 7) from radiator end of lower coolant tube (Figure 4, Item 13).
9. Remove two hose clamps (Figure 4, Items 9 and 11) and hose (Figure 4, Item 10) from water pump end of lower coolant tube (Figure 4, Item 13).

**END OF TASK**

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**Inspect Lower Radiator Hose and Tube Assembly**

1. Inspect hose clips (Figure 4, Items 6, 8, 9, and 11) for cracks, excessive corrosion, or other signs of obvious damage. Repair or replace as required.
2. Inspect hoses (Figure 4, Items 7 and 10) for firmness, cracks, wear, or other signs of obvious damage. Repair or replace as required.
3. Remove any scale from all hose ends with scale-removing compound and wiping rag prior to installation.
4. Inspect lower coolant tube (Figure 4, Item 13) for cracks, damage, or excessive corrosion. Replace as required.
5. Inspect lower port of radiator (Figure 4, Item 5) for damage and corrosion. Replace radiator (Figure 4, Item 5) if damage or corrosion are found (WP 0028, Remove/Install Radiator Assembly).

**END OF TASK****Install Lower Radiator Hose and Tube Assembly**

1. Wipe down all components with a wiping rag prior to installation.
2. Install hose (Figure 4, Item 7) and two hose clips (Figure 4, Items 6 and 8) to radiator end of lower coolant tube (Figure 4, Item 13).
3. Install hose (Figure 4, Item 10) and two hose clips (Figure 4, Items 9 and 11) to water pump end of lower coolant tube (Figure 4, Item 13).
4. Secure lower radiator hose assembly (Figure 3) to engine by installing screw (Figure 4, Item 4) through lower mounting hole in bracket (Figure 4, Item 14). Tighten screw (Figure 4, Item 4) finger-tight.
5. Position spacer (Figure 4, Item 1) and P-clamp (Figure 4, Item 2) to upper mounting hole on bracket (Figure 4, Item 14) and secure by installing screw (Figure 4, Item 3) finger-tight.
6. Position lower radiator hose assembly (Figure 3) to its mounting location in generator set and secure by installing hose (Figure 4, Item 7) to lower port of radiator (Figure 4, Item 5), and hose (Figure 4, Item 10) to water pump (Figure 4, Item 12). Secure by installing hose clips (Figure 4, Items 6, 8, 9, and 11) to their final locations.
7. Tighten screws (Figure 4, Items 3 and 4).
8. Fill radiator with engine coolant (WP 0022, Service Cooling System).
9. Install front body panel (WP 0030, Remove/Install Front Body Panel).
10. Install top body panel (WP 0029, Remove/Install Top Body Panel).
11. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
12. Close generator set doors.
13. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
14. Start engine and check for coolant leaks and proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
15. Repair as required.

**END OF TASK****END OF WORK PACKAGE**





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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL WINTERIZATION KIT COMPONENTS**

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**INITIAL SETUP:****Test Equipment**

Beaker, Laboratory (WP 0179, Table 2, Item 3)

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Heater (WP 0172, Repair Parts List, Figure 67, Item 2)

Pump, fuel (WP 0172, Figure 67, Item 30)

Antifreeze, ethylene glycol (WP 0180, Expendable and Durable Items List, Item 2)

Cap set, protective (WP 0180, Item 8)

Fuel, diesel (WP 0180, Item 21)

Rag, wiping (WP 0180, Item 33)

**Personnel Required**

91D (1)

**References**

WP 0022, Service Cooling System

WP 0037, Remove/Install Batteries

WP 0044, Service Fuel System

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

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**REMOVE/INSTALL WINTERIZATION KIT COMPONENTS**
**WARNING**

- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.
- DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.
- Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required. Failure to comply may cause injury or death to personnel.

**WARNING**

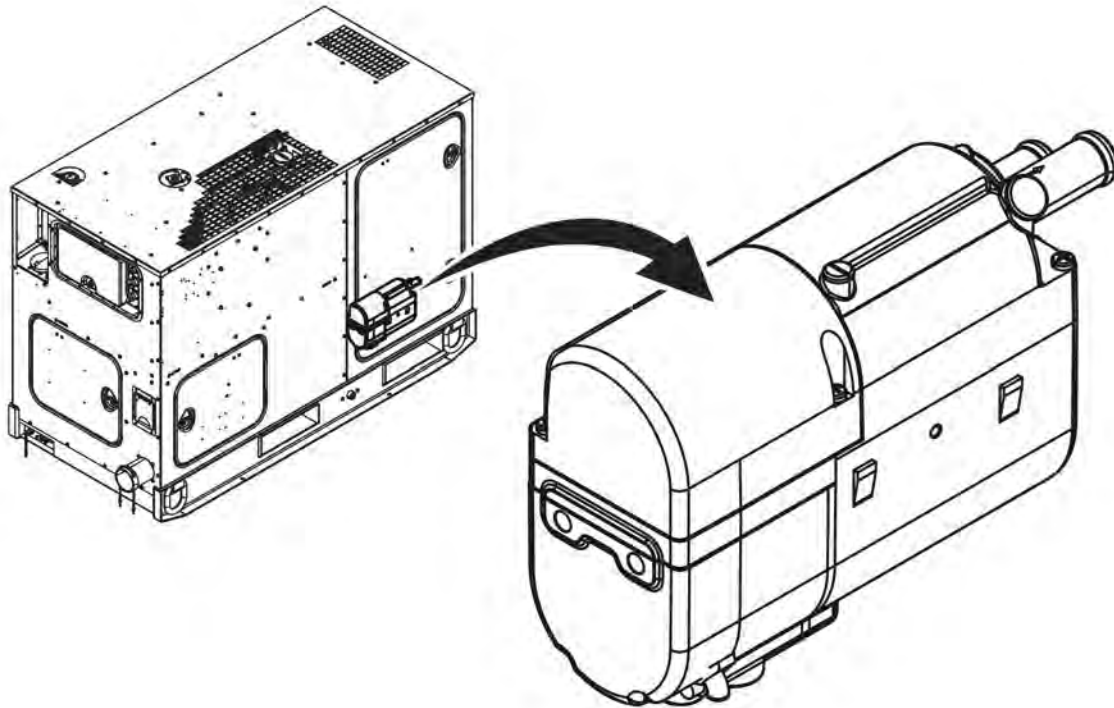
- When operating, winterization kit has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow winterization kit to cool before performing maintenance. Wear

gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

### NOTE

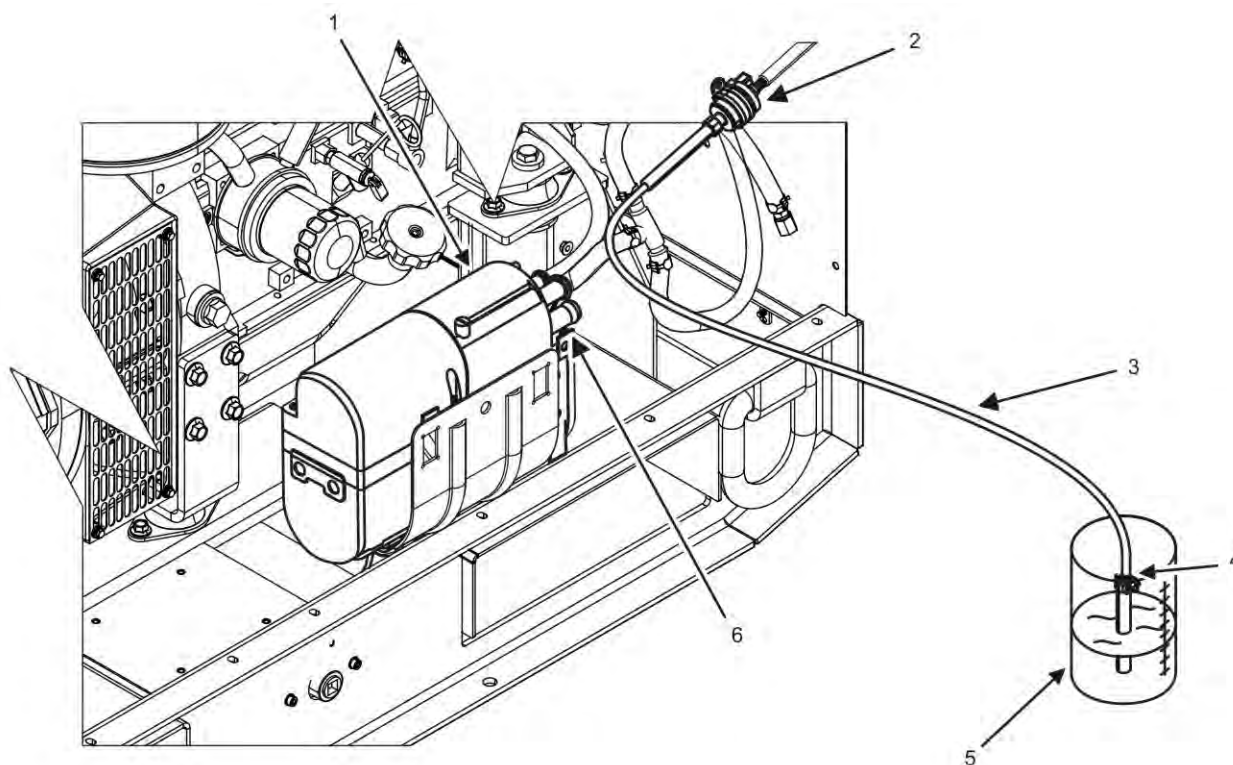
Winterization kit is optional for AMMPS generator sets. This WP instructs how to test, remove, and install winterization kit components to an AMMPS generator set that is already equipped with a winterization kit.

#### Test Winterization Kit Fuel Flow



**Figure 1. Coolant Heater — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door to locate coolant heater (Figure 1) attached to right-side engine mount.
3. Place wiping rags under winterization kit to capture spilled fuel when fuel line is removed.



**Figure 2. Winterization Kit — Test Fuel Flow.**

### NOTE

Capture and dispose of spilled fuel IAW local SOP.

4. Remove hose clamp (Figure 2, Item 4) securing fuel line (Figure 2, Item 3) to fuel port (Figure 2, Item 6) on coolant heater (Figure 2, Item 1).
5. Remove fuel line (Figure 2, Item 3) from coolant heater (Figure 2, Item 1).
6. Place open fuel line (Figure 2, Item 3) into graduated cylinder (Figure 2, Item 5).
7. Cap open fuel port (Figure 2, Item 6) on coolant heater (Figure 2, Item 1) to prevent dirt and debris from entering coolant heater (Figure 2, Item 1).
8. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
9. Run winterization test through DCS (TM-9-6115-752-10).
10. Allow fuel to flow into graduated cylinder (Figure 2, Item 5) until fuel flow is uniform (approximately 40 sec).
11. Stop winterization test (TM 9-6115-752-10).
12. Empty captured fuel from graduated cylinder (Figure 2, Item 5) into a suitable container for disposal.
13. Place open fuel line (Figure 2, Item 3) once again into graduated cylinder (Figure 2, Item 5).
14. Run winterization test again through DCS (TM-9-6115-752-10).
15. Allow fuel to flow into graduated cylinder (Figure 2, Item 5) for 90 sec.
16. Stop winterization test (TM 9-6115-752-10).
17. Verify amount of fuel captured in graduated cylinder (Figure 2, Item 5) during 90-sec test. Fuel flow should be between 0.25 oz (7.5 cm<sup>3</sup>) and 0.29 oz (8.6 cm<sup>3</sup>).



3. Remove metal clip (Figure 3, Item 1) and disconnect wiring harness (Figure 3, Item 9) from winterization kit fuel pump (Figure 3, Item 6).

### NOTE

Capture and dispose of spilled fuel and coolant IAW local SOP.

4. Place a suitable container under winterization kit fuel pump (Figure 3, Item 6) to catch spills.
5. Loosen clamps (Figure 3, Items 3 and 7) and disconnect fuel hoses (Figure 3, Items 2 and 8) from winterization kit fuel pump (Figure 3, Item 6).
6. Insert caps/plugs into fuel lines (Figure 3, Items 2 and 8).
7. Loosen screw (Figure 3, Item 4) securing rubber mounting bracket (Figure 3, Item 5) and winterization kit fuel pump (Figure 3, Item 6) to right-side of engine mount.
8. Remove winterization kit fuel pump (Figure 3, Item 6) and rubber mounting bracket (Figure 3, Item 5) from unit and place on a suitable work surface.
9. Remove winterization kit fuel pump (Figure 3, Item 6) from rubber mounting bracket (Figure 3, Item 5).
10. Dispose of captured fuel and coolant IAW local SOP.
11. Inspect rubber mounting bracket (Figure 3, Item 5) for cracks, brittleness, and damage.
12. Replace rubber mounting bracket (Figure 3, Item 5) if worn or damaged.
13. Inspect winterization kit fuel pump (Figure 3, Item 6) for cracks and other obvious signs of damage.
14. Replace winterization fuel pump (Figure 3, Item 6) if damaged.

### END OF TASK

#### Install Winterization Kit Fuel Pump

### NOTE

Wipe down hoses, parts, and connectors with wiping rag prior to installation.

1. Slide winterization kit fuel pump (Figure 3, Item 6) into rubber mounting bracket (Figure 3, Item 5).
2. Secure rubber mounting bracket (Figure 3, Item 5) and winterization kit fuel pump (Figure 3, Item 6) to right-side of engine mount using screw (Figure 3, Item 4).

### NOTE

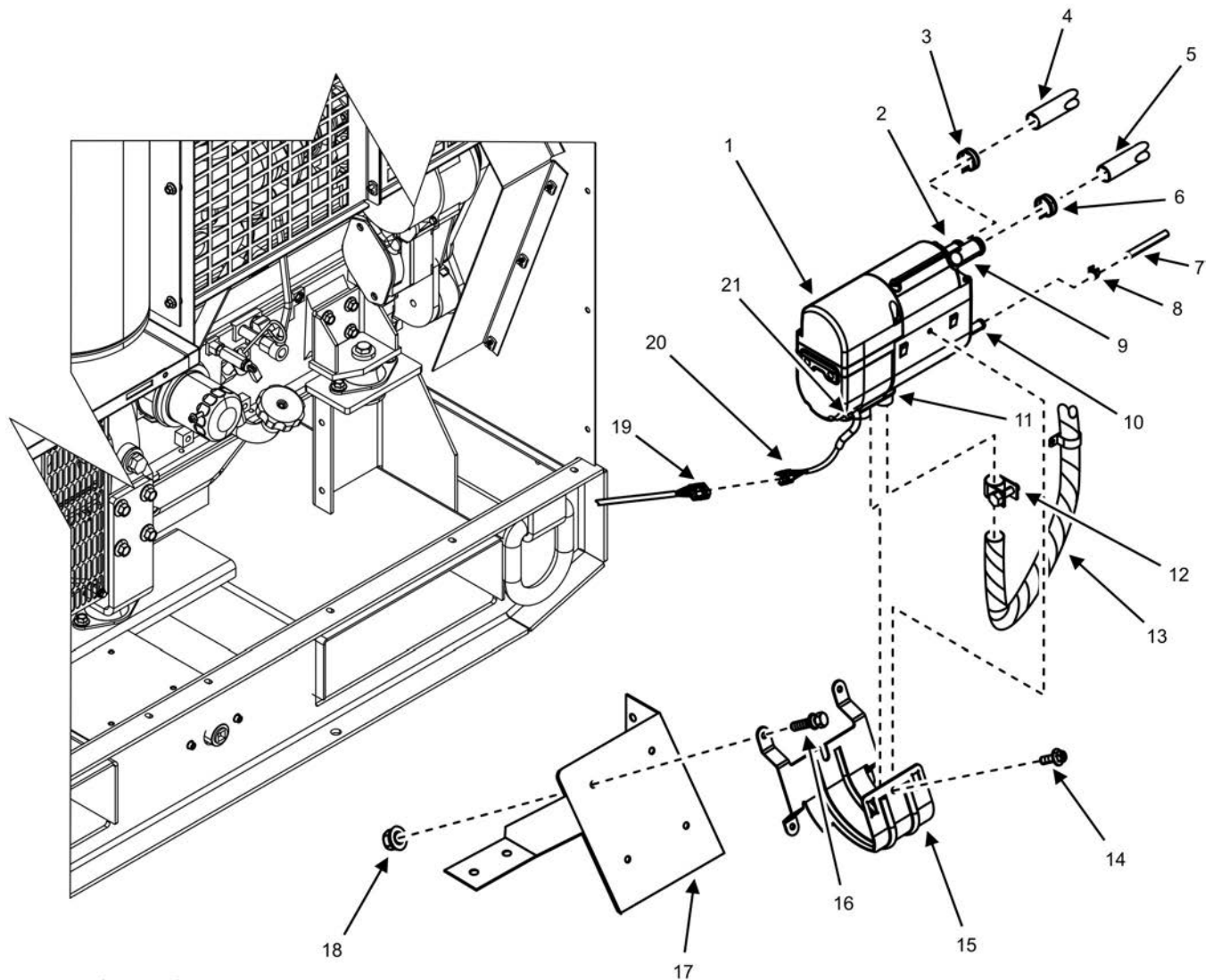
Capture and dispose of spilled fuel and coolant IAW local SOP.

3. Remove caps/plugs from fuel hoses (Figure 3, Items 2 and 8).
4. Connect fuel hoses (Figure 3, Items 2 and 8) to winterization kit fuel pump (Figure 3, Item 6) using clamps (Figure 3, Items 3 and 7).
5. Remove suitable container from under winterization kit fuel pump (Figure 3, Item 6).
6. Connect wiring harness (Figure 3, Item 9) to winterization kit fuel pump (Figure 3, Item 6) using metal clip (Figure 3, Item 1).
7. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
8. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
9. Purge fuel system (WP 0044, Service Fuel System).

- 
10. Start engine and check for proper operation (TM 9-6115-752-10).
  11. Ensure fuel is at proper operating level (TM 9-6115-752-10).
  12. Operate unit until engine reaches normal operating temperature (TM 9-6115-752-10).
  13. Observe coolant temperature indicator on DCS display (TM 9-6115-752-10).
  14. Inspect winterization kit if coolant is not being heated. See Inspect Winterization Kit task.

**END OF TASK****Inspect Winterization Kit**

1. Inspect coolant heater (Figure 4, Item 1) for obvious signs of damage and replace as required.
2. Inspect coolant heater holder (Figure 4, Item 15) for signs of damage and replace as required.
3. Inspect mounting bracket (Figure 4, Item 17) for signs of damage and replace as required.
4. Inspect coolant inlet and outlet hoses (Figure 4, Items 4 and 5) for damage, deterioration, or obstruction. Replace as required.
5. Inspect air exhaust hose (Figure 4, Item 13) for damage, deterioration, or obstructions. Clear or replace as required.
6. Observe coolant temperature indicator on DCS display (TM 9-6115-752-10).



Legend

- |                   |                           |                          |
|-------------------|---------------------------|--------------------------|
| 1. Coolant Heater | 9. Outlet Port            | 17. Mounting Bracket     |
| 2. Inlet Port     | 10. Fuel Inlet Fitting    | 18. Nut                  |
| 3. Hose Clip      | 11. Exhaust Port          | 19. Unit Wiring Harness  |
| 4. Inlet Hose     | 12. Hose Clamp            | 20. Electrical Connector |
| 5. Outlet Hose    | 13. Exhaust Hose          | 21. Air Intake Port      |
| 6. Hose Clip      | 14. Screw                 |                          |
| 7. Fuel Hose      | 15. Coolant Heater Holder |                          |
| 8. Hose Clamp     | 16. Screw                 |                          |

**Figure 4. Coolant Heater Assembly.**

7. Replace coolant heater (Figure 4, Item 1) if coolant is not being heated. See Remove Coolant Heater Assembly task and Install Coolant Heater Assembly task.

**END OF TASK**

---

**Remove Coolant Heater Assembly**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate coolant heater (Figure 1).
3. Drain cooling system (WP 0022, Service Cooling System).
4. Disconnect electrical connector (Figure 4, Item 20) on coolant heater (Figure 4, Item 1) from unit wiring harness (Figure 4, Item 19).

**NOTE**

Capture spilled fuel and coolant and dispose of IAW local SOP. Cap/plug all open fuel/coolant lines/fittings to prevent dirt and debris from entering the fuel/cooling system.

5. Place a suitable coolant catch container under coolant heater (Figure 4, Item 1) to capture spilled coolant.
6. Loosen and slide hose clip (Figure 4, Item 3) on coolant inlet hose (Figure 4, Item 4) away from coolant inlet port (Figure 4, Item 2).
7. Loosen and slide hose clip (Figure 4, Item 6) on coolant outlet hose (Figure 4, Item 5) away from coolant outlet port (Figure 4, Item 9).
8. Remove coolant inlet hose (Figure 4, Item 4) from coolant inlet port (Figure 4, Item 2).
9. Remove coolant outlet hose (Figure 4, Item 5) from coolant outlet fitting (Figure 4, Item 9).
10. Inspect coolant inlet and outlet hoses (Figure 4, Items 4 and 5) for damage or cracking, and replace as required.
11. Remove coolant catch container.

**NOTE**

Capture spilled fuel and coolant and dispose of IAW local SOP. Cap/plug all open fuel/coolant lines/fittings to prevent dirt and debris from entering the fuel/cooling system.

12. Place a suitable fuel catch container under coolant heater (Figure 4, Item 1) to catch spilled fuel.
13. Loosen hose clamp (Figure 4, Item 8) securing fuel hose (Figure 4, Item 7) to fuel port (Figure 4, Item 10).
14. Remove fuel hose (Figure 4, Item 7) from fuel port (Figure 4, Item 10).
15. Remove fuel catch container.
16. Cap/plug all coolant and fuel lines to prevent dirt and debris from entering cooling or fuel systems.
17. Remove hose clamp (Figure 4, Item 12) securing exhaust hose (Figure 4, Item 13) to coolant heater (Figure 4, Item 1).
18. Remove exhaust hose (Figure 4, Item 13) from coolant heater (Figure 4, Item 1).
19. Inspect exhaust hose (Figure 4, Item 13) for damage and replace as required.
20. Remove four screws (Figure 4, Item 16), and four nuts (Figure 4, Item 19) securing coolant heater holder (Figure 4, Item 15) to mounting bracket (Figure 4, Item 17).
21. Remove coolant heater (Figure 4, Item 1) and coolant heater holder (Figure 4, Item 15) from unit and place on a suitable work surface.



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**NOTE**

Two screws (Figure 4, Item 14) secure the coolant heater (Figure 4, Item 1) to the coolant heater holder (Figure 4, Item 15), one in front of the coolant heater and one in the rear. The rear screw requires loosening while the front screw requires complete removal.

22. Loosen and remove two screws (Figure 4, Item 14) securing coolant heater (Figure 4, Item 1) to coolant heater holder (Figure 4, Item 15).
23. Dispose of captured fuel and coolant IAW local SOP.

**END OF TASK****Inspect Coolant Heater Assembly**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove caps/plugs from coolant outlet port (Figure 4, Item 9), inlet port (Figure 4, Item 2), and fuel port (Figure 4, Item 10) of coolant heater (Figure 4, Item 1).
3. Empty residual coolant and fuel from coolant heater (Figure 4, Item 1) into a suitable container.
4. Replace caps/plugs into coolant and fuel ports of coolant heater to prevent dirt and debris from entering coolant heater (Figure 4, Item 1).
5. Inspect air intake port (Figure 4, Item 21) for obstructions, and clear as required.
6. Inspect exhaust port (Figure 4, Item 11) for obstructions, and clear as required.
7. Inspect electrical connector (Figure 4, Item 20) for damage, cracked wires and insulation.
8. Inspect coolant heater (Figure 4, Item 1) for signs of damage.
9. Replace coolant heater (Figure 4, Item 1) if irreparable damage is found.
10. Dispose of captured fuel and coolant IAW local SOP.

**END OF TASK****Install Coolant Heater Assembly**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Position coolant heater (Figure 4, Item 1) in coolant heater holder (Figure 4, Item 15).

**NOTE**

Two screws (Figure 4, Item 14) secure the coolant heater (Figure 4, Item 1) to the coolant heater holder (Figure 4, Item 15), one in front of the coolant heater and one in the rear. The rear screw requires tightening while the front screw requires complete installation.

3. Secure coolant heater (Figure 4, Item 1) to unit by installing and tightening screws (Figure 4, Item 14) through coolant heater holder (Figure 4, Item 15) and into coolant heater (Figure 4, Item 1).
4. Position coolant heater holder (Figure 4, Item 15) and coolant heater (Figure 4, Item 1) to mounting location on mounting bracket (Figure 4, Item 17).
5. Secure coolant heater holder (Figure 4, Item 15) to mounting bracket (Figure 4, Item 17) by installing four screws (Figure 4, Item 16), and four nuts (Figure 4, Item 18).
6. Place exhaust hose (Figure 4, Item 13) onto coolant heater (Figure 4, Item 1).
7. Secure exhaust hose (Figure 4, Item 13) to coolant heater (Figure 4, Item 1) by installing hose clamp (Figure 4, Item 12).

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**NOTE**

Capture spilled fuel/coolant and dispose of IAW local SOP. Remove all caps/plugs from fuel and coolant lines and fittings prior to installation of each fuel or coolant line.

8. Place a suitable container under coolant heater (Figure 4, Item 1) to catch spilled fuel.
9. Remove plug from fuel hose (Figure 4, Item 7).
10. Push fuel hose (Figure 4, Item 7) and hose clamp (Figure 4, Item 8) onto fuel port (Figure 4, Item 10).
11. Secure fuel hose (Figure 4, Item 7) to fuel port (Figure 4, Item 10) on coolant heater (Figure 4, Item 1) by installing hose clamp (Figure 4, Item 8).
12. Remove fuel catch container.
13. Place a suitable coolant catch container under coolant heater (Figure 4, Item 1) to catch spilled coolant.
14. Remove plug from coolant inlet hose (Figure 4, Item 4).
15. Install inlet hose (Figure 4, Item 4) onto inlet port (Figure 4, Item 2) of coolant heater (Figure 4, Item 1).
16. Secure inlet hose (Figure 4, Item 4) to coolant heater (Figure 4, Item 1) by sliding and positioning hose clip (Figure 4, Item 3) over inlet port (Figure 4, Item 2).
17. Remove plug from outlet hose (Figure 4, Item 5).
18. Install outlet hose (Figure 4, Item 5) onto outlet port (Figure 4, Item 9) of coolant heater (Figure 4, Item 1).
19. Secure outlet hose (Figure 4, Item 5) to coolant heater (Figure 4, Item 1) by sliding and positioning hose clip (Figure 4, Item 6) over outlet port (Figure 4, Item 9).
20. Remove coolant catch container.
21. Connect electrical connector (Figure 4, Item 20) from coolant heater (Figure 4, Item 1) to unit wiring harness (Figure 4, Item 19).
22. Fill cooling system (WP 0022, Service Cooling System).
23. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
24. Purge fuel system (WP 0044, Service Fuel System).
25. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
26. Ensure fluid level is at proper operating level (TM 9-6115-752-10).
27. Start engine and allow cooling system to build pressure (TM 9-6115-752-10).
28. Inspect coolant and fuel connections at coolant heater visually for leaks and proper operation.
29. Turn engine control switch OFF (TM 9-6115-752-10).
30. Allow coolant heater to cool while monitoring coolant temperature (TM 9-6115-752-10). Repair leaks or faults found during step 28 as required.
31. Dispose of captured fuel and coolant IAW local SOP.
32. Close all generator set doors.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**INSTALL WINTERIZATION KIT**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, Blind, Fastener, Installation (WP 0179, Table 2, Item 30)

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Kit, winterization (WP 0172, Repair Parts List, Figure 67, Item 1)

Antifreeze, ethylene glycol (WP 0180, Expendable and Durable Items List, Item 2)

Cap set, protective (WP 0180, Item 8)

Rag, wiping (WP 0180, Item 33)

Sealant (WP 0180, Item 34)

**References**

WP 0026, Remove/Install Winterization Kit Components

WP 0044, Service Fuel System

**Personnel Required**

91D (1)

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

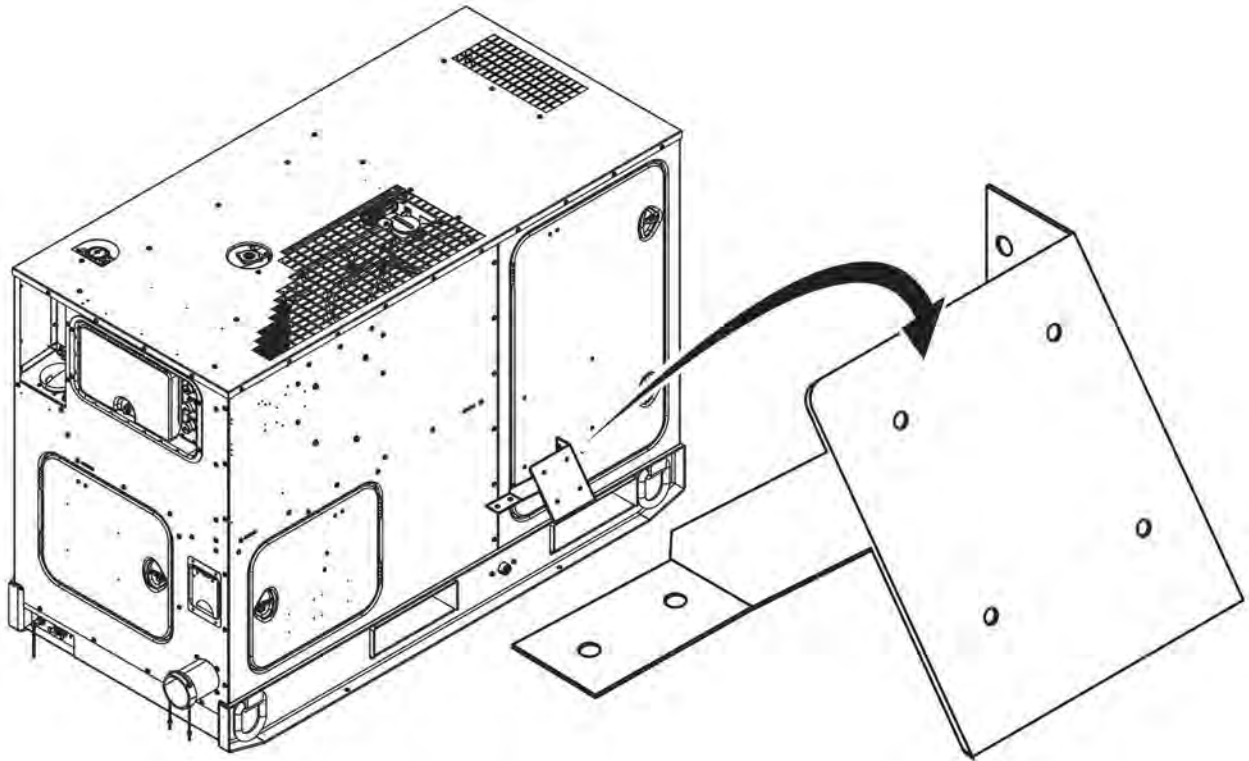
Top body panel removed (WP 0029, Remove/Install Top Body Panel)

Coolant drained (WP 0022, Service Cooling System)

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**INSTALL WINTERIZATION KIT****WARNING**

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.
- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.
- Hearing protection requested during maintenance or repair with engine running. Failure to comply can cause hearing loss.
- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator set is running. Failure to comply may cause injury or death to personnel.

**Install Winterization Kit**

**Figure 1. Winterization Kit Mounting — Location.**

**NOTE**

Winterization kit is optional for AMMPS generator sets. This WP instructs how to install winterization kit to an AMMPS generator set not equipped with a winterization kit

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door.
3. Locate winterization kit mounting location on unit skid (Figure 1).

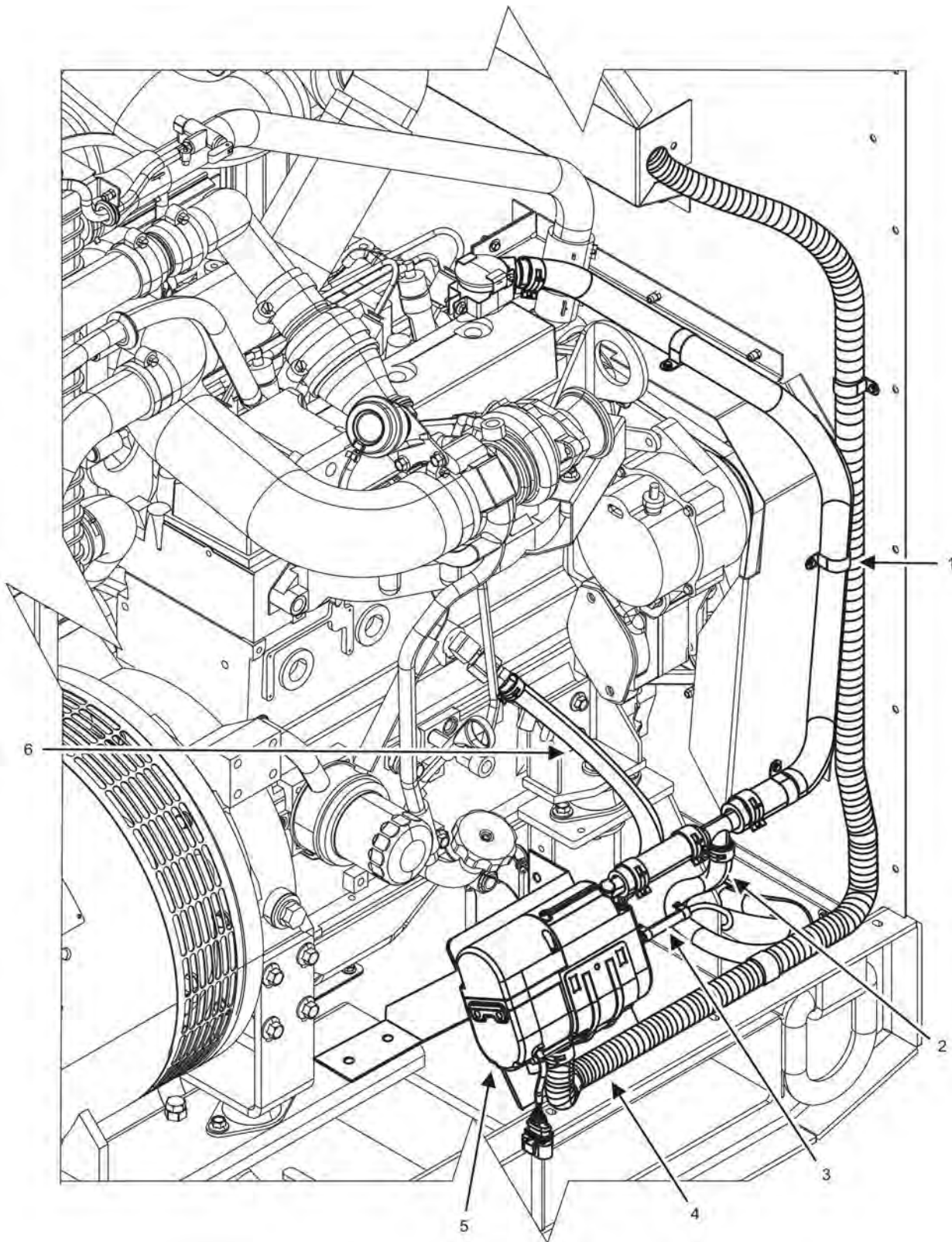
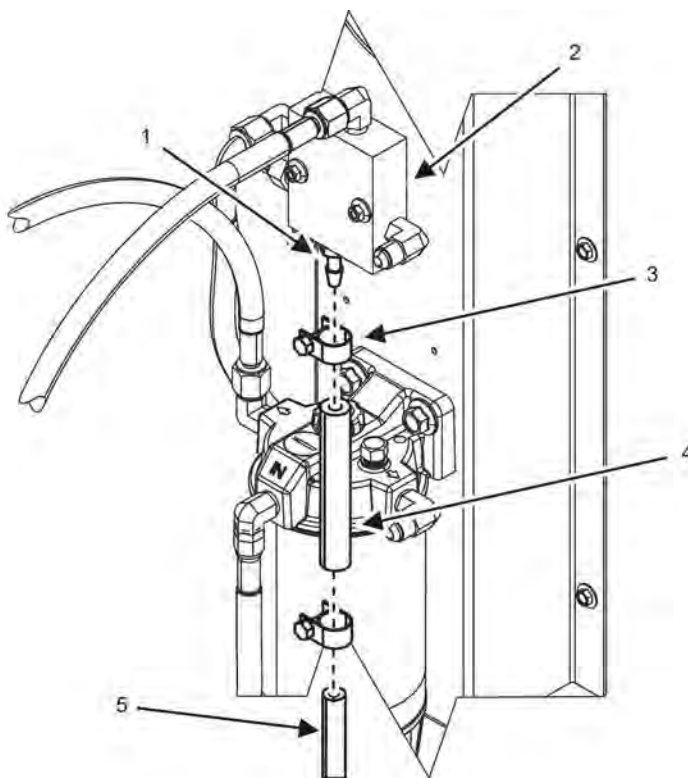


Figure 2. Winterization Kit Assembly.

**NOTE**

Winterization kit assembly (Figure 2) requires two fuel line (Figure 2, Item 3) assemblies. One fuel line (Figure 2, Item 3) assembly connects from the fuel manifold (Figure 3, Item 2) to the winterization kit fuel pump (not shown). The second fuel line (Figure 2, Item 3) connects the winterization kit fuel pump (not shown) to the coolant heater (Figure 2, Item 5). Fuel line (Figure 2, Item 3) assembly that connects winterization kit fuel pump (not shown) to coolant heater (Figure 2, Item 5) is installed in steps 13 and 14 of this task.

4. Prepare coolant heater fuel lines (Figure 2, Item 3).
  - a. Insert one end of fuel tube (Figure 3, Item 5) into flexible hose (Figure 3, Item 4).



**Figure 3. Coolant Heater Fuel Line Assembly.**

- b. Secure with hose clamp (Figure 3, Item 3).
- c. Repeat steps 4a – b for other end of fuel tube (Figure 3, Item 5).
- d. Repeat steps 4a – c to assemble a second coolant heater fuel line (Figure 2, Item 3) assembly.
- e. Insert hose adaptor (Figure 3, Item 1) into flexible hose (Figure 3, Item 4) of fuel line (Figure 2, Item 3) assembly and secure with hose clamp (Figure 3, Item 3).

**NOTE**

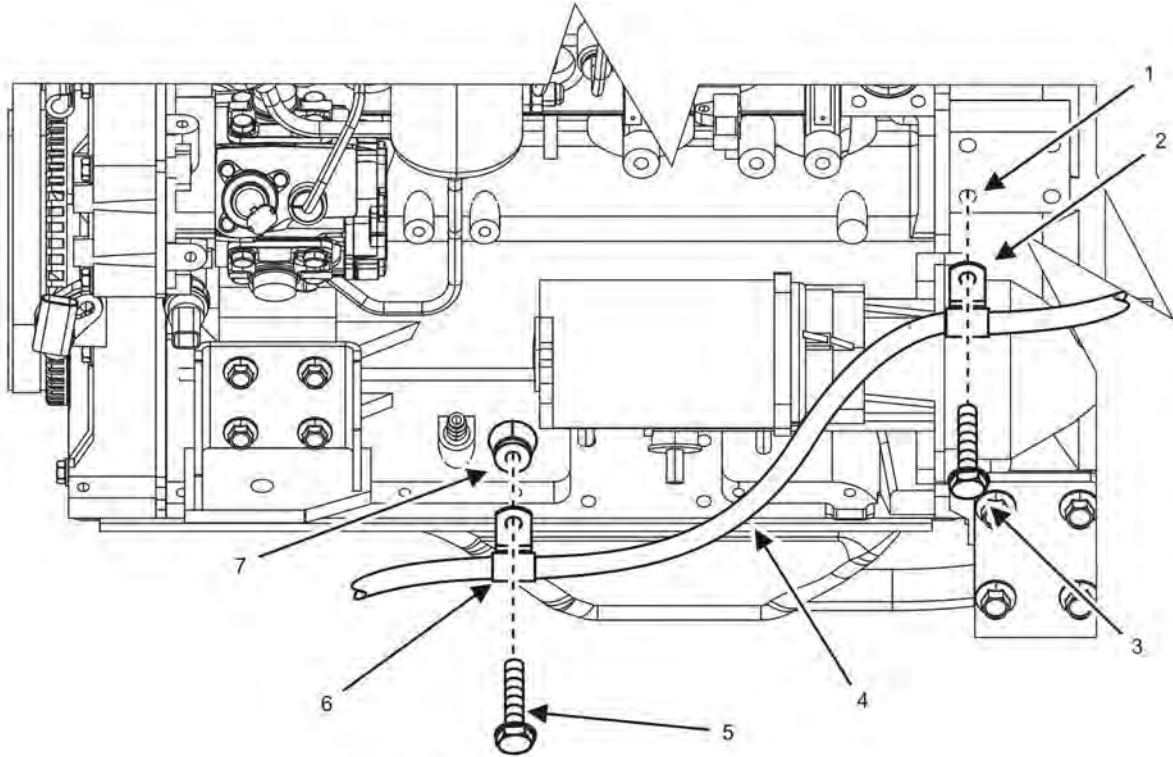
Use pipe thread sealant on all pipe threads of hose adaptor (Figure 3, Item 1). Cure time is 30 min to use full system and 72 hr for full strength.

- f. Apply pipe thread sealant to male threads of hose adaptor (Figure 3, Item 1).

**NOTE**

Capture spilled fuel and dispose of IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

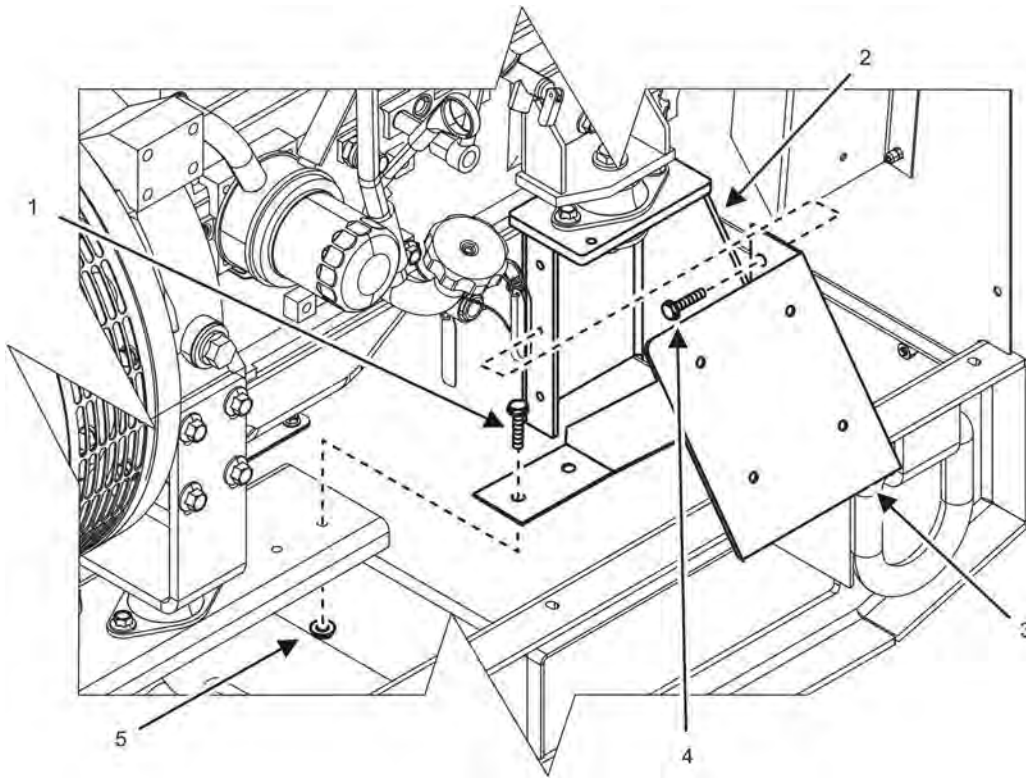
- g. Remove plug (not shown) from fuel manifold (Figure 3, Item 2).
- h. Capture spilled fuel.
- i. Install hose adaptor (Figure 3, Item 1) to fuel manifold (Figure 3, Item 2) and secure to 1 – 1 1/2 turns past finger-tight.



**Figure 4. Fuel Line P-Clamp — Installation.**

- j. Position two P-clamps (Figure 4, Items 6 and 2) around fuel line assembly (Figure 4, Item 4).
- k. Secure two P-clamps (Figure 4, Items 6 and 2) to engine block locations (Figure 4, Items 1 and 7) with two screws (Figure 4, Items 3 and 5).
- l. Reserve second fuel line (Figure 2, Item 3) assembly for installation in steps 13 and 14.





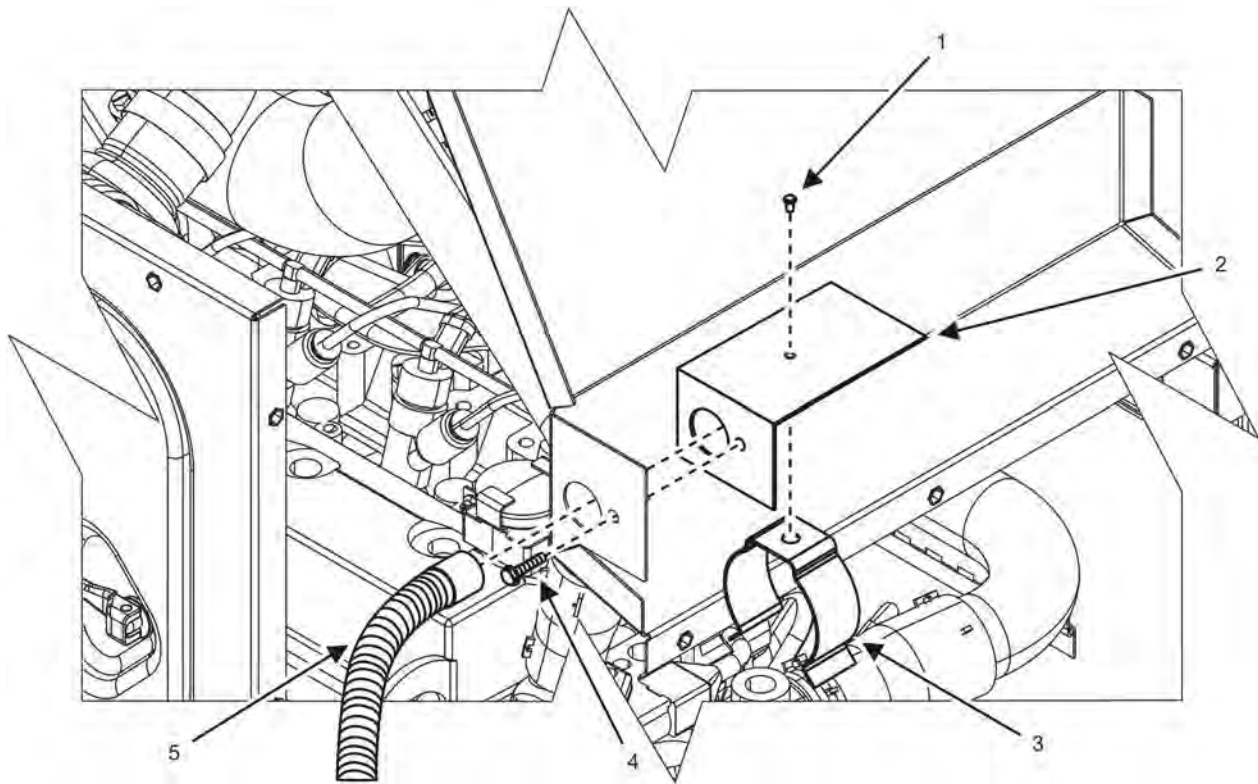
**Figure 5. Mounting Bracket — Installation.**

5. Position mounting bracket (Figure 5, Item 3) to engine mount (Figure 5, Item 2) of skid base and align mounting holes.

#### **NOTE**

Two nuts (Figure 5, Item 5) secure two screws (Figure 5, Item 1) that attach mounting bracket (Figure 5, Item 3) to skid. Clinch nuts (not shown) secure two screws (Figure 5, Item 4) that secure the mounting bracket (Figure 5, Item 3) to the engine mount (Figure 5, Item 2).

6. Install two screws (Figure 5, Item 1) and two nuts (Figure 5, Item 5) to secure mounting bracket (Figure 5, Item 3) to skid base.
7. Install two screws (Figure 5, Item 4) to secure mounting bracket (Figure 5, Item 3) to engine mount (Figure 5, Item 2).
8. Tighten screws (Figure 5, Items 1 and 4) installed in steps 6 and 7 to 87 – 105 in/lb (10 – 11 Nm).



**Figure 6. Air Exhaust Tube Bracket — Installation.**

9. Prepare air exhaust tube (Figure 2, Item 4).
  - a. Rivet clip (Figure 6, Item 3) to air exhaust tube bracket (Figure 6, Item 2) with blind rivet (Figure 6, Item 1).
  - b. Position air exhaust tube bracket (Figure 6, Item 2) to position on weather shield.
  - c. Secure air exhaust tube bracket (Figure 6, Item 2) to weather shield with mounting screw (Figure 6, Item 4).
  - d. Position air exhaust tube (Figure 2, Item 4) as depicted in Figure 2.
  - e. Insert end of air exhaust tube (Figure 6, Item 5) into clip (Figure 6, Item 3) of air exhaust tube bracket (Figure 6, Item 2).

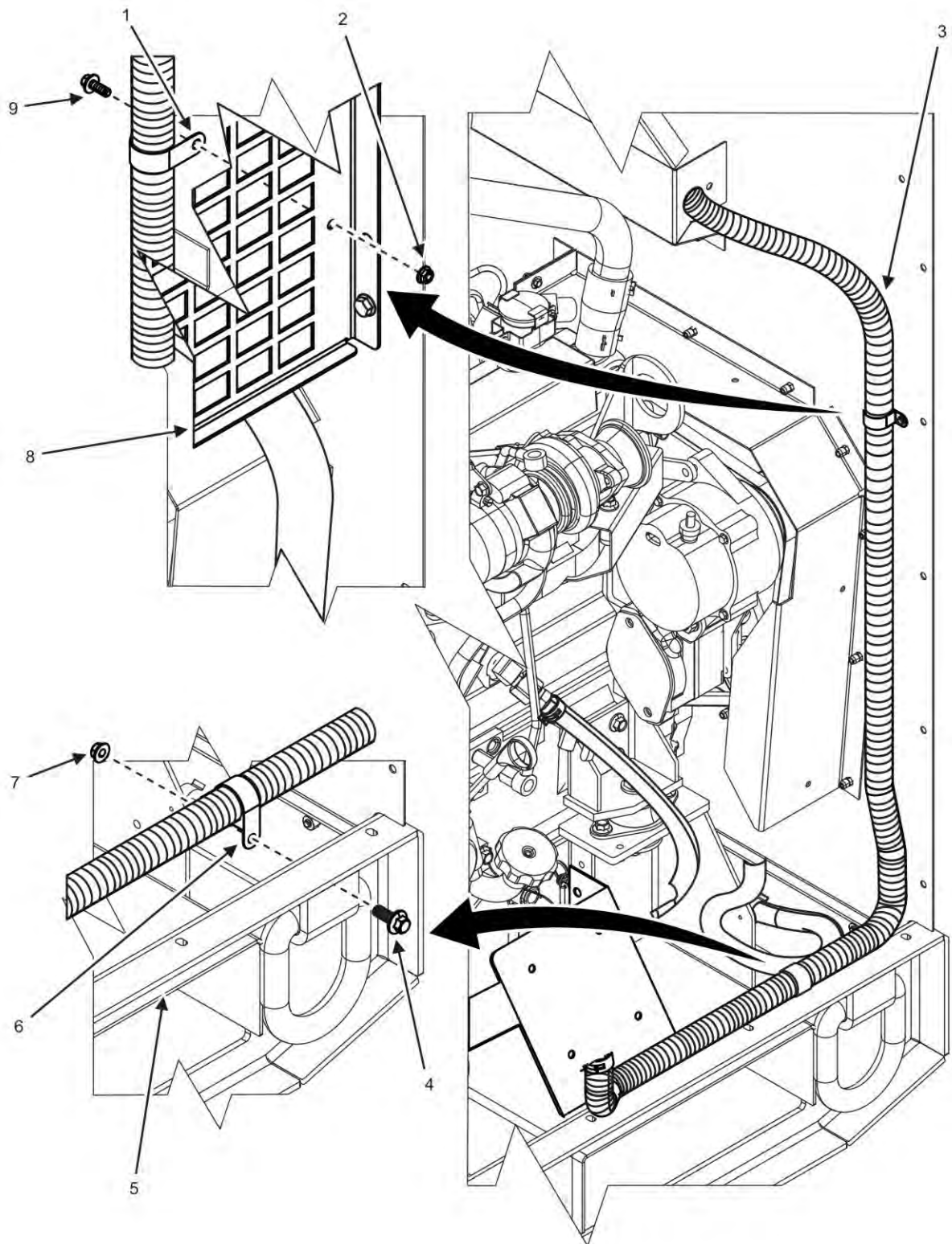


Figure 7. Air Exhaust Tube — Installation.

**NOTE**

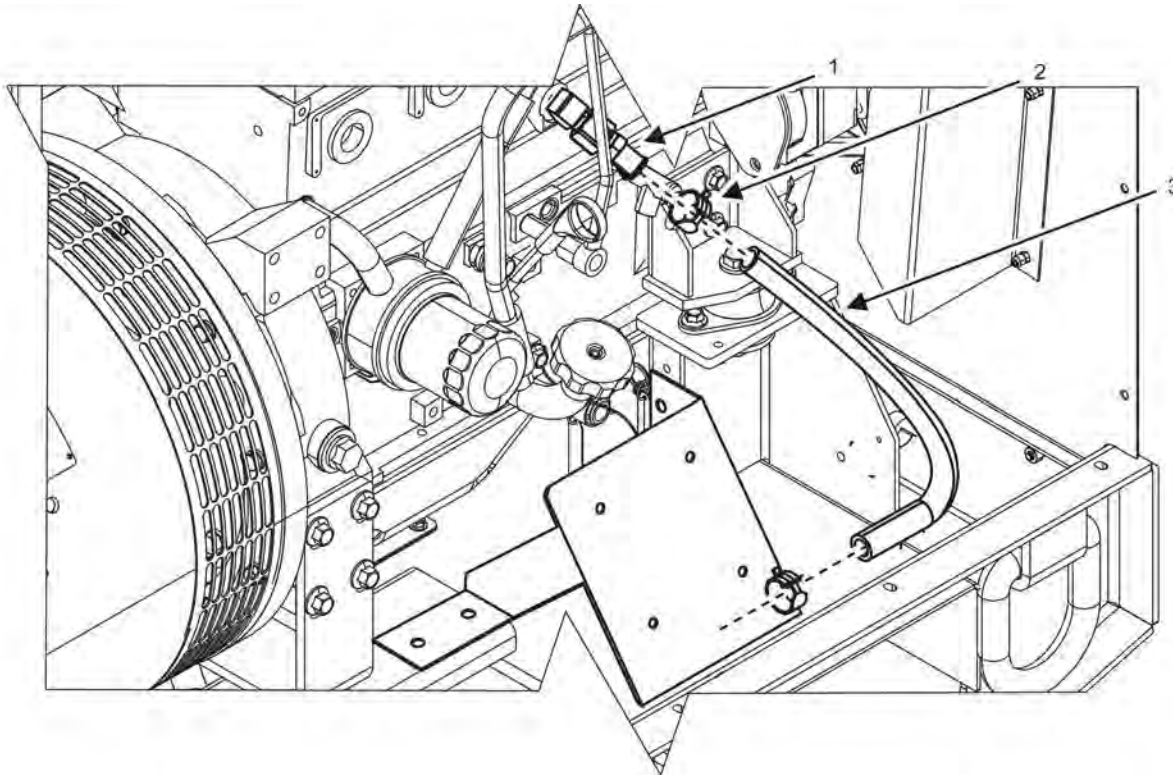
Air exhaust tube (Figure 2, Item 5) will be installed to coolant heater (Figure 2, Item 5) during step 14.

- f. Insert air exhaust tube (Figure 7, Item 3) through two P-clamps (Figure 7, Items 1 and 6).
- g. Position P-clamps (Figure 7, Items 1 and 6) to unit skid (Figure 7, Item 5) and heat shield (Figure 7, Item 8) as depicted in Figure 7.

**NOTE**

Do not fully tighten screws (Figure 7, Items 4 and 9) and nuts (Figure 7, Items 2 and 7) securing P-clamps (Figure 7, Items 4 and 7) to unit skid (Figure 7, Item 5) and heat shield (Figure 7, Item 8) until installation of coolant heater (Figure 2, Item 5) is complete.

- h. Install P-clamps (Figure 7, Items 1 and 6) loosely to unit skid (Figure 7, Item 5) and heat shield (Figure 7, Item 8) with screws (Figure 7, Items 4 and 9) and nuts (Figure 7, Items 2 and 7).



**Figure 8. Coolant Heater Inlet Hose Assembly.**

- 
10. Prepare coolant heater inlet hose assembly (Figure 2, Item 6).

**NOTE**

Capture spilled coolant and dispose of with IAW local SOP. Cap/plug all open coolant lines/fittings to prevent dirt and debris from entering the cooling system.

- a. Remove coolant drain hose (not shown) from engine adaptor barb fitting (Figure 8, Item 1).

**NOTE**

Opposite end of coolant heater inlet hose (Figure 8, Item 3) will be installed in step 14.

- b. Install one end of coolant heater inlet hose (Figure 8, Item 3) to engine adaptor barb fitting (Figure 8, Item 1) and secure with clip (Figure 8, Item 2).
- c. Reserve other end of coolant heater inlet hose (Figure 8, Item 3) for installation in step 14.

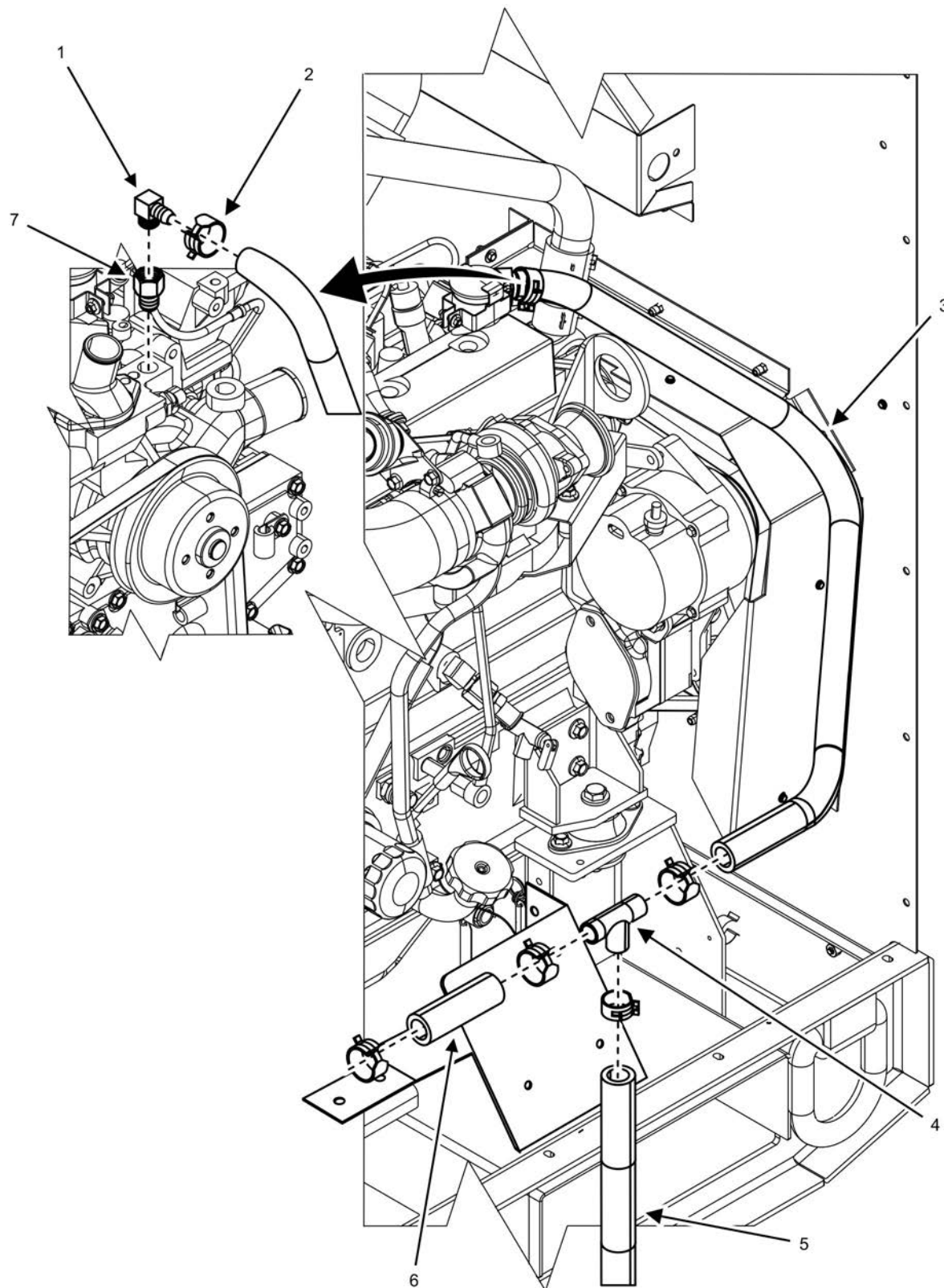


Figure 9. Coolant Heater Outlet Hose Assembly.

11. Prepare coolant heater outlet hose assembly (Figure 2, Item 2).
  - a. Loosen clamp (not shown) and remove plug (not shown) from engine block.

### NOTE

Use pipe sealant on all male pipe threads of adaptor pipe (Figure 9, Item 7) and elbow (Figure 9, Item 1). Cure time is 30 min to use winterization kit and 72 hr for full strength.

- b. Apply sealant to male threads of adaptor pipe (Figure 9, Item 7) and elbow (Figure 9, Item 1).
- c. Install adaptor pipe (Figure 9, Item 7) to engine block opening. Secure adaptor pipe (Figure 9, Item 7) 1 – 1 1/2 turns past finger-tight.
- d. Install elbow (Figure 9, Item 1) to adaptor pipe (Figure 9, Item 7). Secure elbow (Figure 9, Item 1) 1 – 1 1/2 turns past finger-tight.
- e. Install one end of coolant hose (Figure 9, Item 3) to elbow (Figure 9, Item 1) and secure with hose clip (Figure 9, Item 2).
- f. Install three P-clamps (Figure 2, Item 3) around coolant hose (Figure 9, Item 3).
- g. Position three P-clamps (Figure 2, Item 3) to unit belt guard as depicted in Figure 2.

### NOTE

Do not fully tighten screws (not shown) and nuts (not shown) securing P-clamps (Figure 2, Item 3) to belt guard until installation of coolant heater (Figure 2, Item 5) is complete.

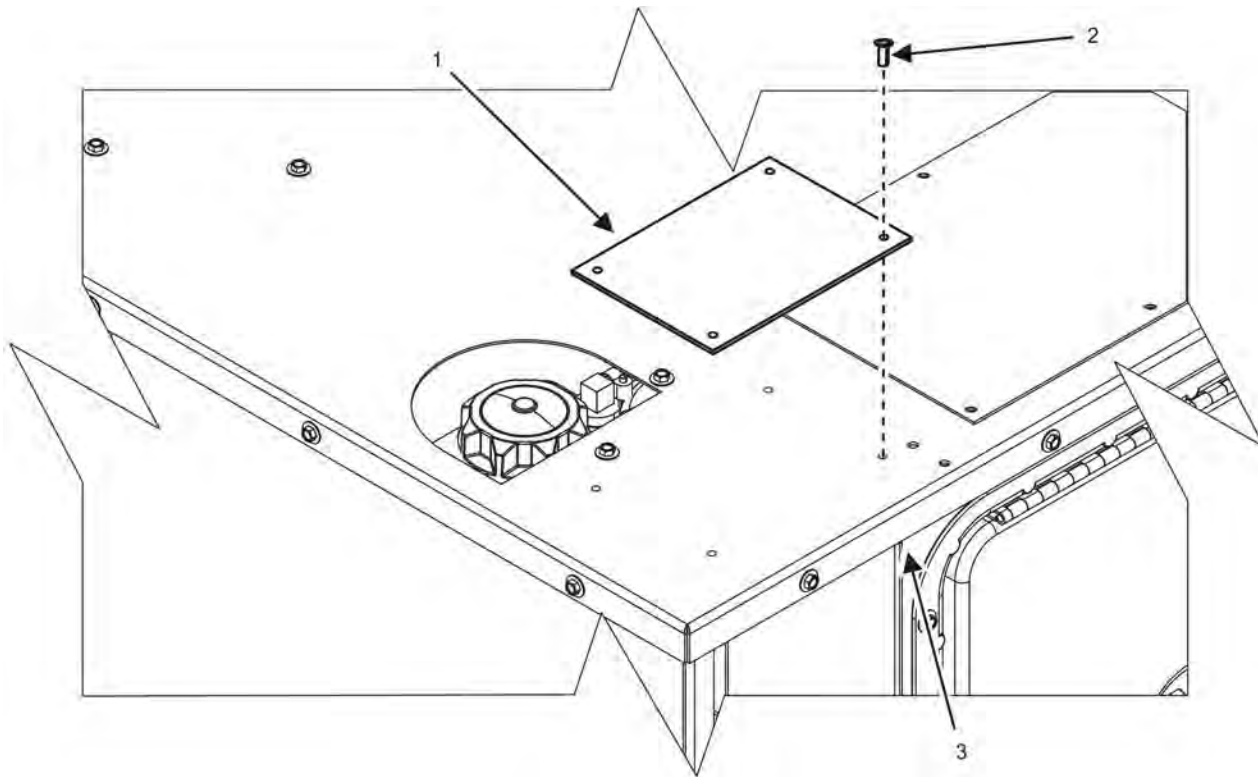
- h. Install P-clamps (Figure 2, Item 3) loosely to belt guard.
- i. Install T-adaptor (Figure 9, Item 4) (in orientation shown in Figure 9) to open end of coolant hose (Figure 9, Item 3). Secure with hose clip (Figure 9, Item 2).
- j. Install coolant drain hose (Figure 9, Item 5) to T-adaptor (Figure 9, Item 4) opening. Secure with clip (Figure 9, Item 2).
- k. Install coolant hose (Figure 9, Item 6) to last opening of T-adaptor (Figure 9, Item 4). Secure with clip (Figure 9, Item 2).

### NOTE

Other end of coolant hose (Figure 9, Item 6) will be installed with coolant heater (Figure 2, Item 5) in step 14.

- l. Reserve hose clip for installation of coolant hose (Figure 9, Item 6) in step 14.
12. Install coolant heater and holder to mounting bracket (WP 0026, Remove/Install Winterization Kit Components).
13. Install winterization kit fuel pump and connect fuel lines (Figure 2, Item 3) (WP 0026, Remove/Install Winterization Kit Components).
14. Install coolant heater (Figure 2, Item 5) and connect coolant outlet and inlet hose assemblies (Figure 2, Item 2 and 6), fuel lines (Figure 2, Item 3), air exhaust tube (Figure 2, Item 4), and electrical connector (not shown) (WP 0026, Remove/Install Winterization Kit Components).
15. Tighten three screws (not shown) and nuts (not shown) securing P-clamps (Figure 2, Item 1) of coolant outlet hose assembly (Figure 2, Item 2) to unit skid and inside panel as shown in Figure 2.
16. Tighten bolts and nuts (Figure 2, Items 5, 7, and 8) that secure air exhaust tube (Figure 2, Item 1) to unit skid and inside panel.

17. Fill cooling system (WP 0022, Service Cooling System).
18. Install top body panel (WP 0029, Remove/Install Top Body Panel).



**Figure 10. Operating Instructions — Installation.**

19. Drill four holes of 3.5 mm diameter in rear left of top body panel (Figure 10, Item 3) using existing holes in operating instructions plate (Figure 10, Item 1) as a guide.
20. Rivet operating instructions plate (Figure 10, Item 1) to rear left corner of top body panel (Figure 10, Item 3) with four blind rivets (Figure 10, Item 2).
21. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
22. Close and secure generator set doors.
23. Ensure fluid level is at proper operating level (TM 9-6115-752-10).
24. Release air through overflow vent line for 5 min before start-up (TM 9-6115-752-10).
25. Purge fuel system (WP 0044, Service Fuel System).
26. Test winterization kit (WP 0026, Remove/Install Winterization Kit Components).
27. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
28. Start engine and check for proper operation (TM 9-6115-752-10).
29. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL RADIATOR ASSEMBLY**

---

**INITIAL SETUP:**

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Radiator assembly (WP 0115, Repair Parts List, Figure 10, Item 6)

Antifreeze, ethylene glycol (WP 0180, Expendable and Durable Items List, Item 2)

Cap set, protective (WP 0180, Item 8)

Distilled water (WP 0180, Item 19)

Grease, electrically conductive (WP 0180, Item 22)

Pan, drain (WP 0180, Item 30)

Rag, wiping (WP 0180, Item 33)

**Personnel Required**

91D (1)

Assistant (1)

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Cooling system drained (WP 0022, Service Cooling System)

Upper and lower radiator hoses removed from radiator (WP 0025, Remove/Install Radiator Hose and Tube Assemblies)

Coolant overflow hose removed from radiator (WP 0023, Remove/Install Coolant Recovery System)

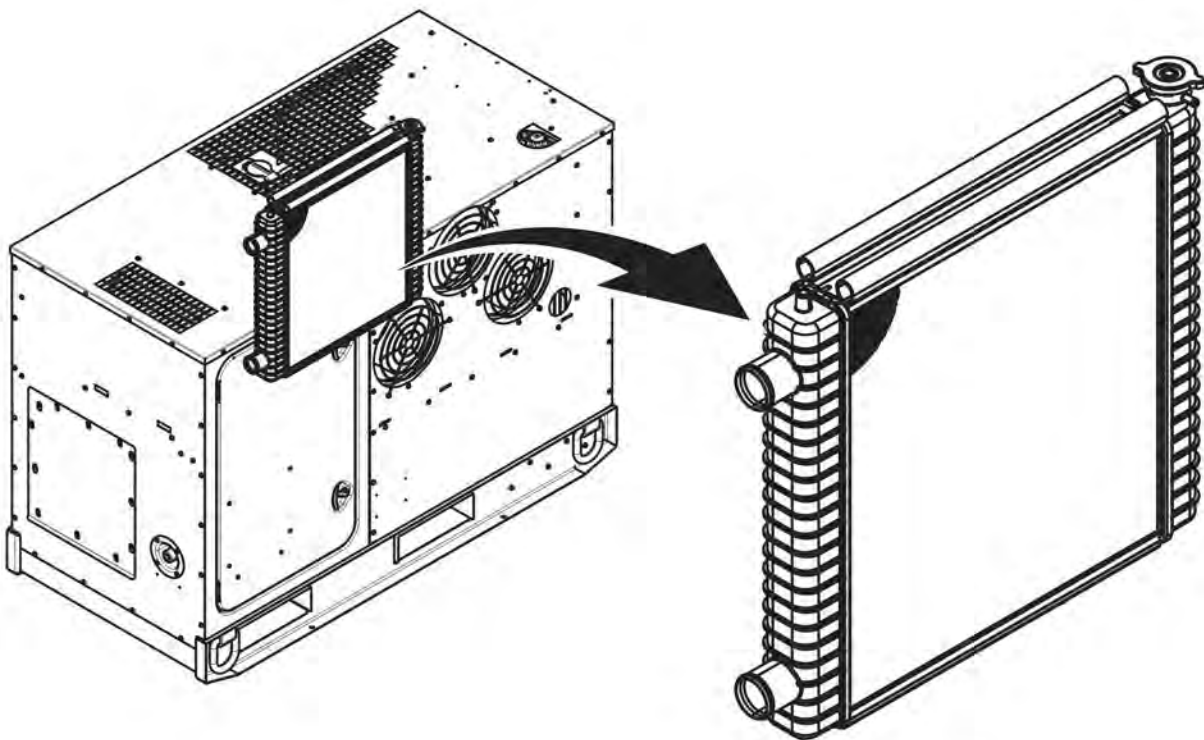
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**REMOVE/INSTALL RADIATOR ASSEMBLY**

**WARNING**

- Hot coolant can burn. If the radiator cap is hot to the touch, it is too hot to open. Allow the coolant to cool before opening the radiator cap. Wear gloves, additional protective clothing, and goggles as required. Contact with high-pressure steam and/or liquids can cause burns and scalding. Failure to comply may cause injury or death to personnel.
- Engine coolant is toxic to eyes and poisonous if ingested. Eye protection is required when working with engine coolant. Avoid repeated or prolonged contact. Failure to comply may cause injury or death to personnel.

## Remove Radiator Assembly



**Figure 1. Radiator — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate radiator (Figure 1).

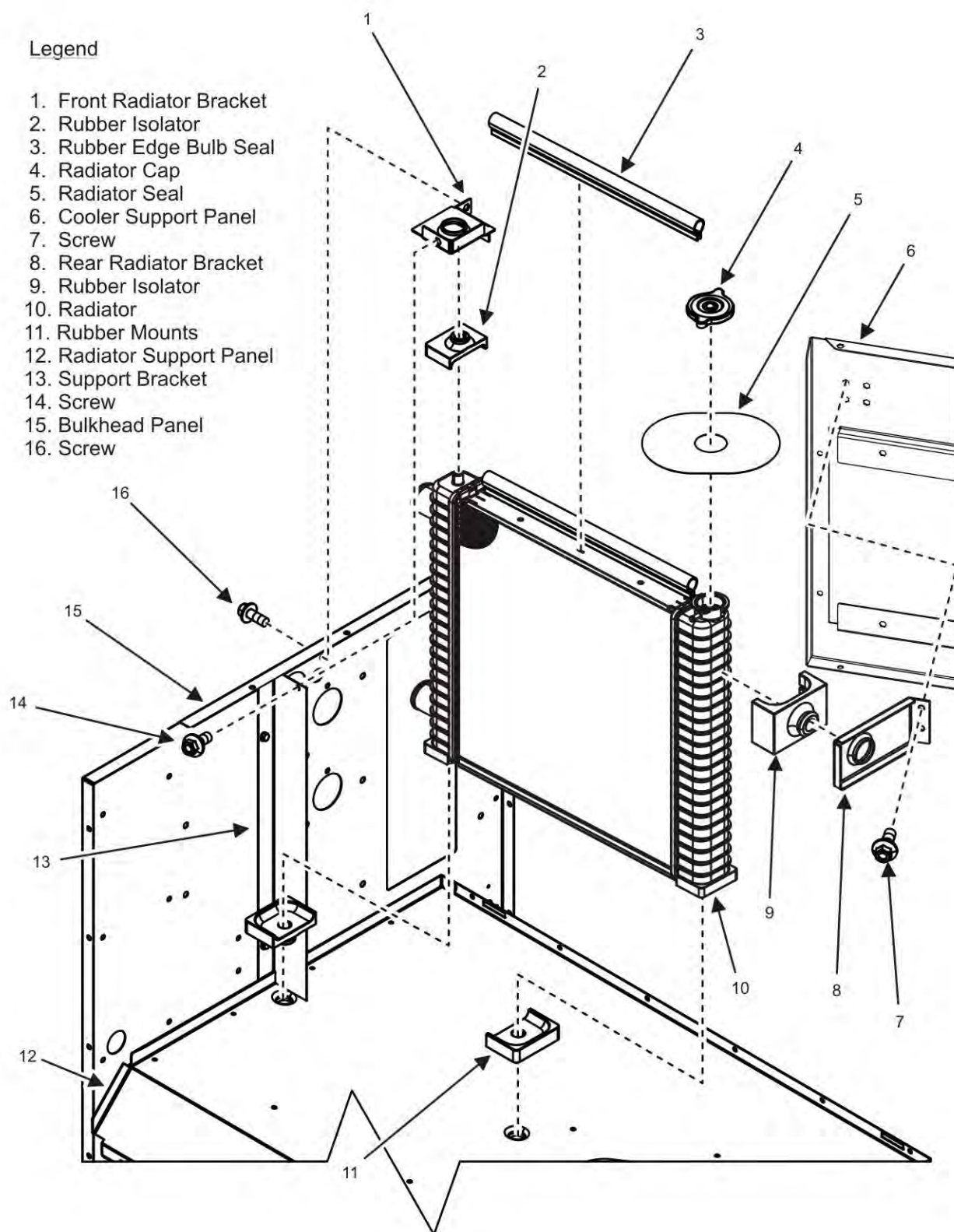


Figure 2. Radiator — Removal.

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**NOTE**

Capture spilled residual coolant and dispose IAW local SOP. Cap/plug all open coolant hoses and ports to minimize spillage of residual coolant when radiator is removed. Caps/plugs also prevent dirt and debris from entering the cooling system.

3. Ensure radiator cap (Figure 2, Item 4) is installed on radiator (Figure 2, Item 10) to minimize spillage of residual coolant when radiator (Figure 2, Item 10) is removed.
4. Ensure fittings on radiator (Figure 2, Item 10) are capped to minimize spillage of residual coolant when radiator (Figure 2, Item 10) is removed.
5. Remove two rubber edge bulb seals (Figure 2, Item 3) from top of radiator (Figure 2, Item 10) and allow them to remain inside generator set.
6. Remove two screws (Figure 2, Item 7) securing rear radiator bracket (Figure 2, Item 8) to cooler support panel (Figure 2, Item 6).
7. Remove rear radiator bracket (Figure 2, Item 8) and rubber isolator (Figure 2, Item 9) from radiator (Figure 2, Item 10).
8. Inspect rear radiator bracket (Figure 2, Item 8) and rubber isolator (Figure 2, Item 9) for cracks, tears, and other damage. Replace damaged components as required.
9. Remove two screws (Figure 2, Items 14 and 16) securing front radiator bracket (Figure 2, Item 1) and rubber isolator (Figure 2, Item 2) to support bracket (Figure 2, Item 13) on bulkhead panel (Figure 2, Item 15).
10. Inspect front radiator bracket (Figure 2, Item 1) and rubber isolator (Figure 2, Item 2) for cracks, tears, and other damage. Replace damaged components as required.
11. Remove radiator (Figure 2, Item 10) from unit and place on suitable work surface.

**END OF TASK****Inspect Radiator Assembly**

1. Remove any dirt and debris from exterior of radiator (Figure 2, Item 10).
2. Remove two rubber mounts (Figure 2, Item 11) from bottom corners of radiator (Figure 2, Item 10).
3. Inspect rubber mounts (Figure 2, Item 11) for excessive wear, brittleness, or other signs of damage. Replace components as required.
4. Inspect rubber edge bulb seal (Figure 2, Item 3) on bottom of radiator (Figure 2, Item 10) for cuts, tears, and brittleness. Replace rubber edge bulb seal (Figure 2, Item 5) as required.
5. Inspect radiator seal (Figure 2, Item 5) under radiator cap (Figure 2, Item 4) for cuts, tears, and brittleness. Replace radiator seal (Figure 2, Item 5) as required.
6. Inspect radiator (Figure 2, Item 10) exterior for punctures, tears, crushed fins, or damage to radiator connector hose fittings.
7. Inspect radiator (Figure 2, Item 10) for signs of leakage where side tanks meet the core.
8. Replace radiator (Figure 2, Item 10) if any damage listed in steps 6 and 7 is found.

**END OF TASK**

---

**Install Radiator Assembly**

1. Wipe down all components using wiping rags prior to installation.

**NOTE**

The radiator support panel (Figure 2, Item 12) has two depressions designed to cradle the rubber mounts (Figure 2, Item 11) on the bottom corners of the radiator (Figure 2, Item 10).

2. Install rubber mounts (Figure 2, Item 11) to bottom of radiator (Figure 2, Item 10).
3. Place connector hose fittings of radiator (Figure 2, Item 10) through openings in bulkhead panel (Figure 2, Item 15).
4. Position radiator (Figure 2, Item 10) to its mounting location inside unit with rubber mounts (Figure 2, Item 11) placed into depressions in radiator support panel (Figure 2, Item 12).
5. Place front radiator bracket (Figure 2, Item 1) and rubber isolator (Figure 2, Item 2) to mounting location on top of radiator (Figure 2, Item 10).
6. Align mounting holes of front radiator bracket (Figure 2, Item 1) with mounting hole on bulkhead panel (Figure 2, Item 15) and support bracket (Figure 2, Item 13).
7. Install two screws (Figure 2, Items 14 and 16) finger-tight to secure front radiator bracket (Figure 2, Item 1) to support bracket (Figure 2, Item 13) and bulkhead panel (Figure 2, Item 15).
8. Position rear radiator bracket (Figure 2, Item 8) and rubber isolator (Figure 2, Item 9) to mounting location on cooler support panel (Figure 2, Item 6).
9. Install two screws (Figure 2, Item 7) finger-tight to secure rear radiator bracket (Figure 2, Item 8) to cooler support panel (Figure 2, Item 6).
10. Tighten screws (Figure 2, Items 7, 14, and 16) installed in steps 7 and 9.
11. Install two rubber edge bulb seals (Figure 2, Item 3) on top of radiator (Figure 2, Item 10).

**NOTE**

Remove all caps/plugs from radiator before installation.

12. Install coolant overflow hose to radiator (Figure 2, Item 10) (WP 0023, Remove/Install Coolant Recovery System).
13. Install upper and lower radiator hoses (WP 0025, Remove/Install Radiator Hose and Tube Assemblies).

**NOTE**

In order to check all cooling system connections after replacement of the radiator, the top body panel must not be installed until the unit has been operated and checked for leaks.

Installing a new radiator (Figure 2, Item 10) requires flushing the cooling system (WP 0022, Service Cooling System).

14. Flush cooling system if installing new radiator (Figure 2, Item 10) (WP 0022, Service Cooling System).
15. Fill cooling system (WP 0022, Service Cooling System) and ensure radiator cap (Figure 2, Item 6) is properly installed.
16. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
17. Close all generator set doors.

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**WARNING**

Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.

**CAUTION**

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

**NOTE**

Install top body panel after unit has been checked for leaks.

18. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
19. Start engine and run until reaching normal operating temperature (TM 9-6115-752-10).
20. Check for leaks and repair as required.
21. Install top body panel (WP 0029, Remove/Install Top Body Panel).
22. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
23. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL TOP BODY PANEL**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Roof, enclosure (WP 0109, Repair Parts List, Figure 4, Item 1)

Grease, electrically conductive (WP 0180, Expendable and Durable Items List, Item 22)

**Personnel Required**

91D (1)

Assistant (1)

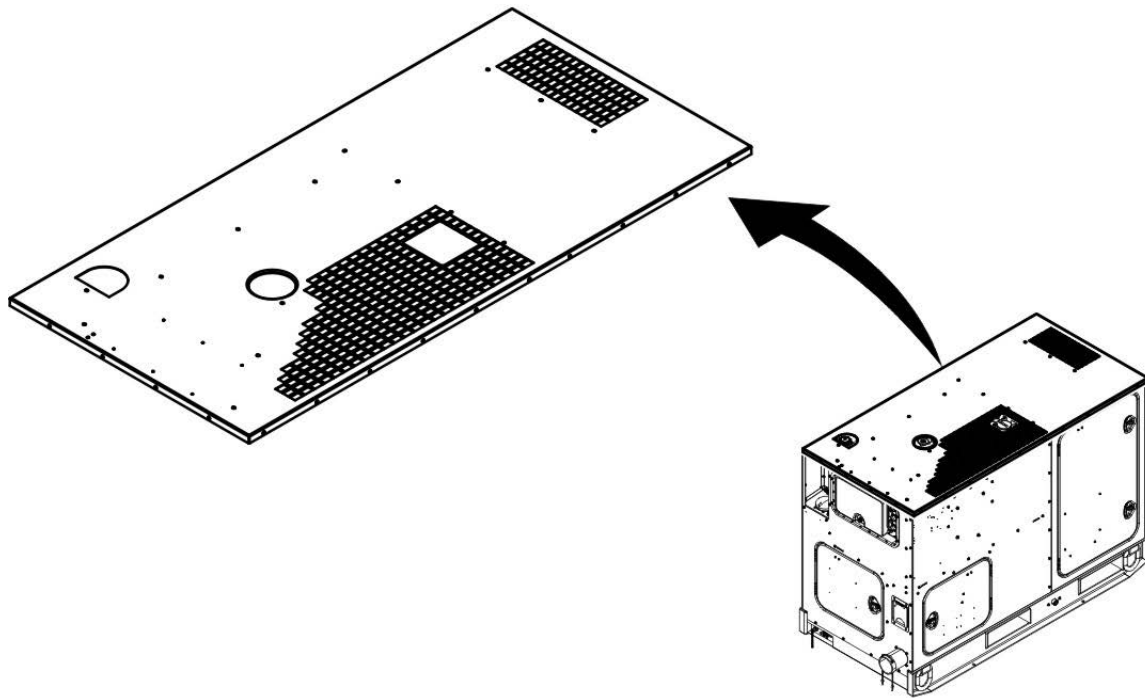
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**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

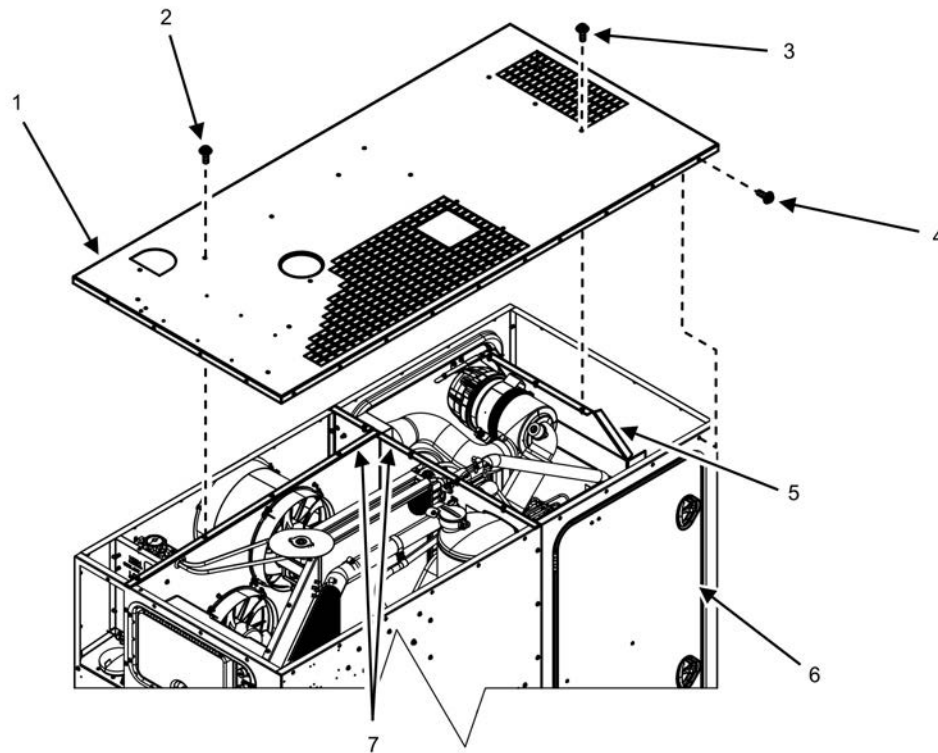
Battery ground cable removed (WP 0037, Remove/Install Batteries)

**REMOVE/INSTALL TOP BODY PANEL****Remove Top Body Panel**

**Figure 1. Top Body Panel — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.





**Figure 2. Top Body Panel Removal — Detail.**

2. Remove 27 screws (Figure 2, Item 4) securing edges of top body panel (Figure 2, Item 1) to generator set (Figure 2, Item 6) body panels.
3. Remove 12 screws (Figure 2, Item 2) securing top body panel (Figure 2, Item 1) to internal body panels (Figure 2, Item 7) of generator set (Figure 2, Item 6).
4. Remove three screws (Figure 2, Item 3) securing unit weather shield (Figure 2, Item 5) to top body panel (Figure 2, Item 1) of generator set (Figure 2, Item 6).

### **NOTE**

The top body panel (Figure 2, Item 1) is large and awkward for one person to manage and will require an additional person to remove.

5. Remove top body panel (Figure 2, Item 1) from unit and place on flat surface to prevent damage to panel.

### **END OF TASK**

#### **Inspect Top Body Panel**

1. Inspect top body panel (Figure 2, Item 1) for damage, cracks, or corrosion. Repair minor damage as required.
2. Replace top body panel (Figure 2, Item 1) if cracked or showing serious damage.
3. Inspect unit weather shield (Figure 2, Item 5) for damage and replace if damaged.
4. Inspect socket head cap screws (Figure 2, Items 2, 3, and 4) for damage and replace as required.

### **END OF TASK**

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**Install Top Body Panel****NOTE**

The top body panel (Figure 2, Item 1) is large and awkward for one person to manage and will require an additional person to install.

1. Position top body panel (Figure 2, Item 1) on generator set (Figure 2, Item 6) and align mounting holes.
2. Install and finger-tighten three screws (Figure 2, Item 3) securing unit weather shield (Figure 2, Item 5) to top body panel (Figure 2, Item 1).
3. Install and finger-tighten 12 screws (Figure 2, Item 2) securing top body panel (Figure 2, Item 1) to internal body panels (Figure 2, Item 7) of unit.
4. Install and finger-tighten 27 screws (Figure 2, Item 4) securing top body panel (Figure 2, Item 1) around perimeter of unit.
5. Secure all screws (Figure 2, Items 2, 3, and 4) installed in steps 2, 3, and 4 to 87 – 105 in/lb (10 – 12 Nm).
6. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
7. Close generator set doors.

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL FRONT BODY PANEL**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Panel, enclosure, front (WP 0109, Repair Parts List, Figure 4, Item 14)

Cap set, protective (WP 0180, Expendable and Durable Items List, Item 8)

Grease, electrically conductive (WP 0180, Item 22)

Rag, wiping (2) (WP 0180, Item 33)

Strap, tie-down (WP 0180, Item 36)

**Personnel Required**

91D (1)

Assistant (1)

**References**

WP 0043, Remove/Install NATO Slave Receptacle

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

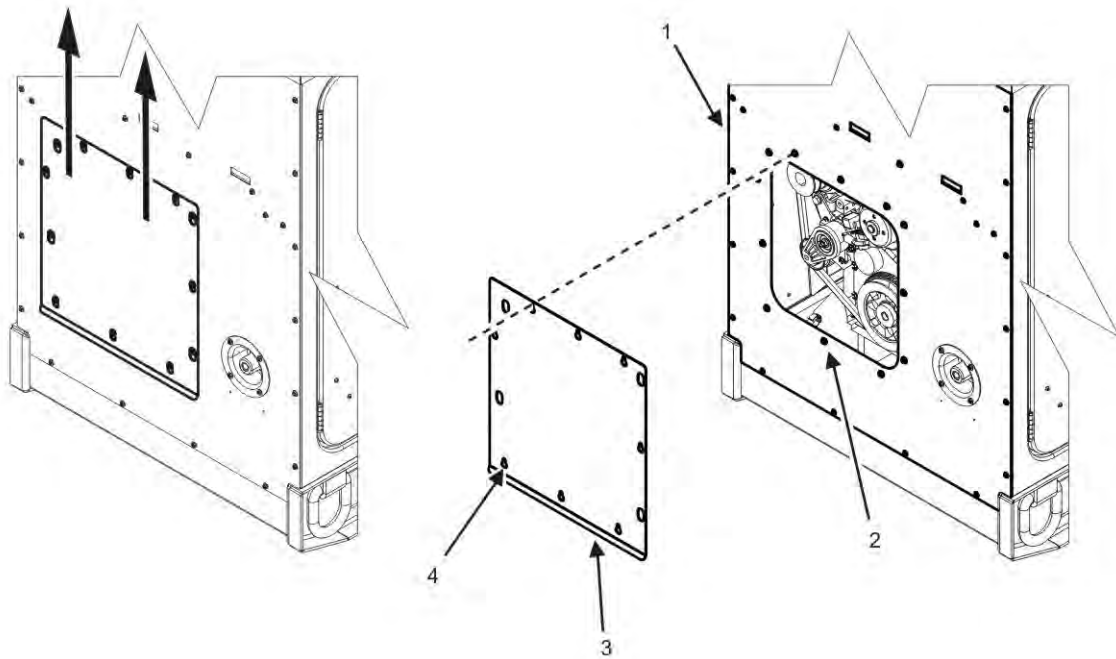
Top body panel removed (WP 0029, Remove/Install Top Body Panel)

Air cleaner removed (WP 0020, Service Air Cleaner)

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**REMOVE/INSTALL FRONT BODY PANEL****WARNING**

NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.

**Remove Access Panel****Figure 1. Access Panel — Removal.**

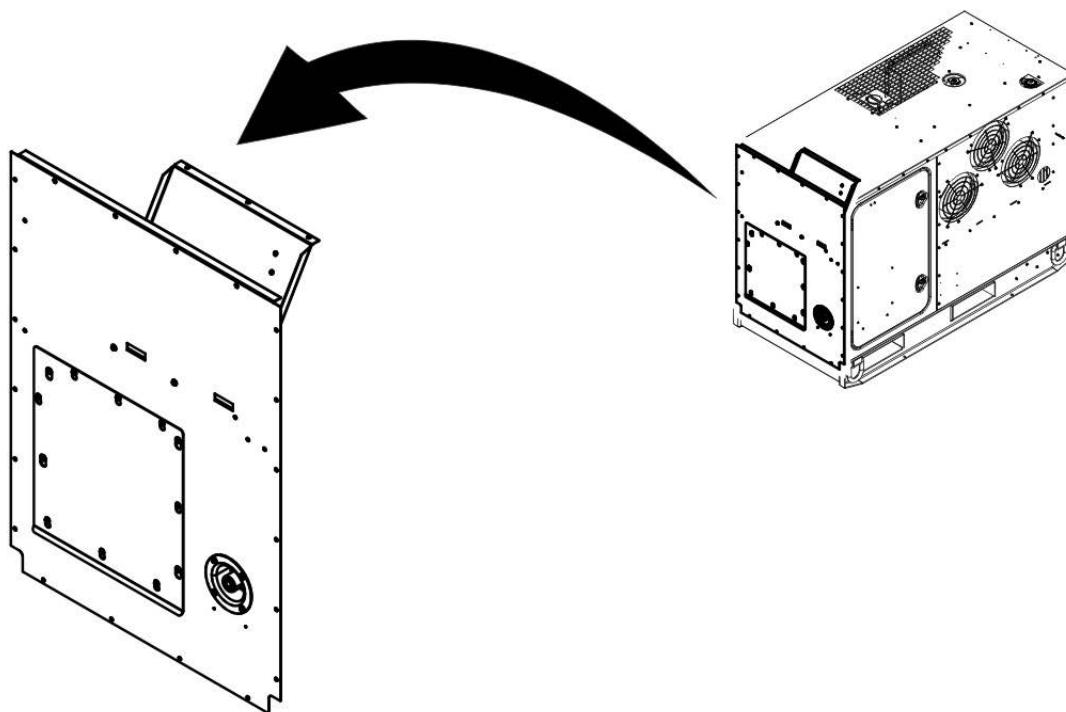
1. Loosen without removing eight screws (Figure 1, Item 2) of access panel (Figure 1, Item 3).
2. Move access panel (Figure 1, Item 3) upwards until screws (Figure 1, Item 2) are centered in circular part of key-hole openings (Figure 1, Item 4).
3. Remove access panel (Figure 1, Item 3).
4. Inspect access panel (Figure 1, Item 3) for damage and corrosion. Repair or replace as required.

**END OF TASK****Install Access Panel**

1. Position access panel's key-hole openings (Figure 1, Item 4) over screws (Figure 1, Item 2) on front panel (Figure 1, Item 1).
2. Slide access panel (Figure 1, Item 3) downwards until narrow portion of key-hole openings (Figure 1, Item 4) rest on screws (Figure 1, Item 2).
3. Tighten eight screws (Figure 1, Item 2).

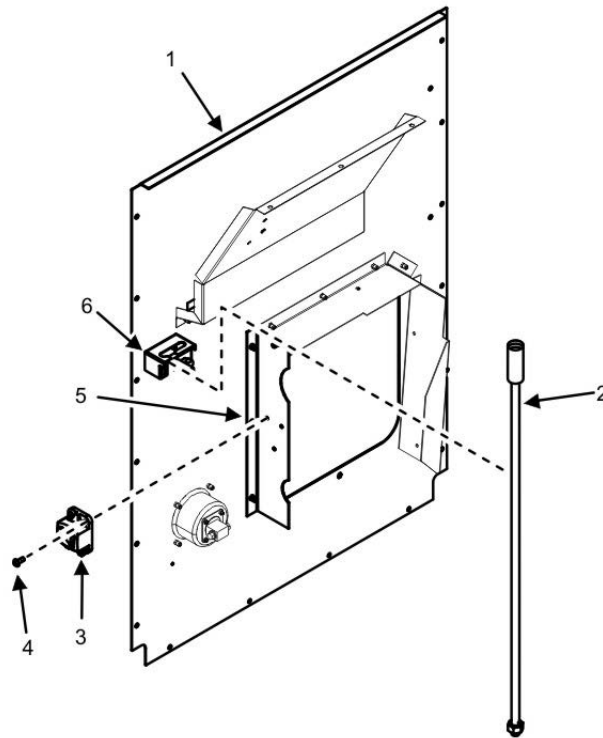
**END OF TASK**

## Remove Front Body Panel



**Figure 2. Front Body Panel — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate front body panel (Figure 2).
3. Tag and remove positive and negative cables from NATO slave receptacle (WP 0043, Remove/Install NATO Slave Receptacle).



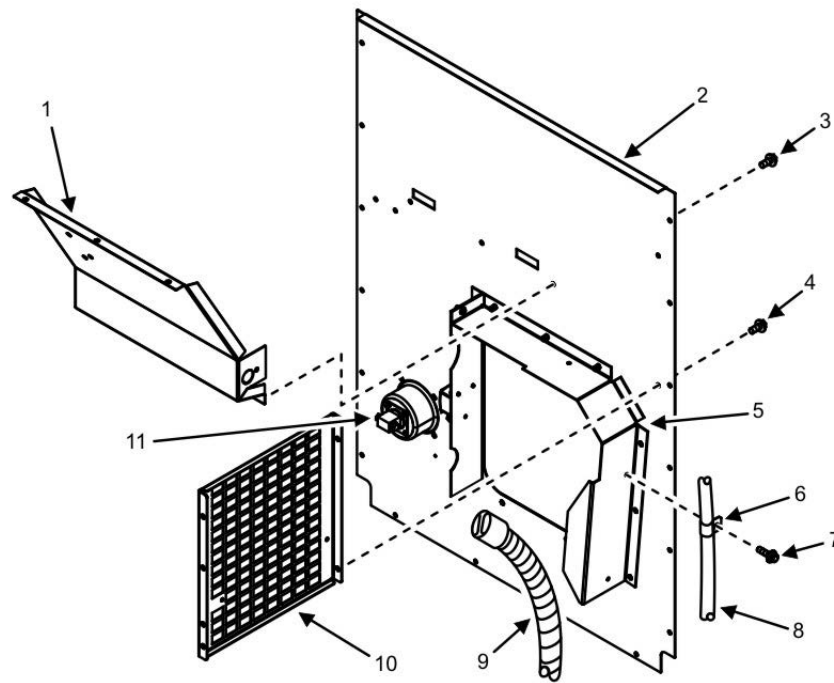
**Figure 3. Parts Removal — Left Side.**

### NOTE

Capture and dispose of spilled fluids IAW local SOP.

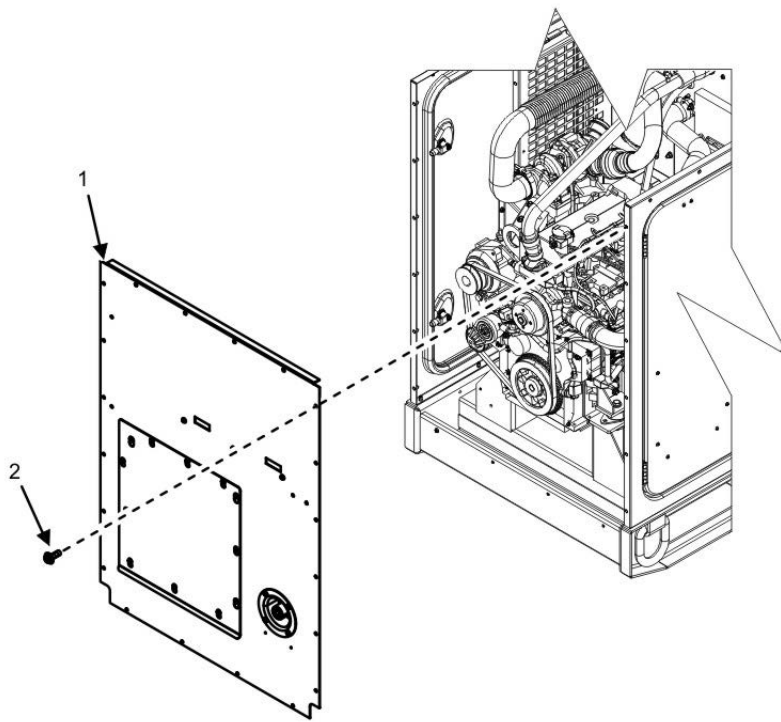
Cap/plug all open fluid lines/fittings to prevent dirt and debris from entering the engine.

4. Open left- and right-side doors of unit.
5. Remove ground rods (Figure 3, Item 2) from stowage location (Figure 3, Item 6) (if stowed) on inside of front body panel (Figure 3, Item 1) and set aside for reuse.
6. Remove three screws (Figure 3, Item 4) securing main DC circuit breaker (Figure 3, Item 3) to left side of belt guard (Figure 3, Item 5) and place main DC circuit breaker (Figure 3, Item 3) in bottom of unit.



**Figure 4. Parts Removal — Right Side.**

7. Remove two screws (Figure 4, Item 4) securing right half of exhaust heat shield (Figure 4, Item 5) to front body panel (Figure 4, Item 2).
8. Remove winterization exhaust tube (Figure 4, Item 9) (if kit is installed) by snapping winterization exhaust tube (Figure 4, Item 9) out of clip (not shown) securing winterization exhaust tube (Figure 4, Item 9) to underside of weather shield (Figure 4, Item 1).
9. Remove three screws (Figure 4, Item 7) securing three P-clamps (Figure 4, Item 6) attaching coolant outlet hose (Figure 4, Item 8) to right side of belt guard (Figure 4, Item 5).
10. Place coolant outlet hose (Figure 4, Item 8) away from front body panel (Figure 4, Item 2) in unit.
11. Remove three screws (Figure 4, Item 3) securing weather shield (Figure 4, Item 1) to front body panel (Figure 4, Item 2) and remove weather shield (Figure 4, Item 1) from unit.



**Figure 5. Front Body Panel — Removal/Installation.**

### **CAUTION**

When the front body panel (Figure 4, Item 2) is removed, the NATO slave receptacle (Figure 4, Item 11), engine belt guards (Figure 3, Item 5 and Figure 4, Item 5), and grounding rod stowage location (Figure 3, Item 6) will remain attached to the front body panel (Figure 5, Item 1). Handle front body panel (Figure 5, item 1) carefully when removing. Failure to comply may cause damage to equipment.

12. Remove 16 screws (Figure 5, Item 2) securing perimeter of front body panel (Figure 5, Item 1) to unit.
13. Remove front body panel (Figure 5, Item 1) from unit and place on a suitable work surface.

### **END OF TASK**

#### **Inspect Front Body Panel**

1. Inspect front body panel (Figure 5, Item 1) for damage or corrosion. Repair or replace as required.
2. Inspect engine belt guards (Figure 3, Item 5 and Figure 4, Item 5) for damage or corrosion. Repair or replace as required.

### **END OF TASK**



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**Install Front Body Panel**

1. Place front body panel (Figure 5, Item 1) at mounting location on unit.
2. Secure front body panel (Figure 5, Item 1) with 16 screws (Figure 5, Item 2).
3. Install main DC circuit breaker (Figure 3, Item 3) to left-side belt guard (Figure 3, Item 5) using three screws (Figure 3, Item 4).
4. Install weather shield (Figure 4, Item 1) to front body panel (Figure 4, Item 2) using three screws (Figure 4, Item 3).
5. Attach winterization exhaust tube (Figure 4, Item 9) (if kit is installed) to underside of weather shield (Figure 4, Item 1) by inserting winterization exhaust tube (Figure 4, Item 9) into clip (not shown) and snapping winterization exhaust tube (Figure 4, Item 9) cap into clip (not shown).
6. Install three screws (Figure 4, Item 7) securing P-clamps (Figure 4, Item 6) and attaching coolant outlet hose (Figure 4, Item 8) to right side of belt guard (Figure 4, Item 5).
7. Install right half of exhaust heat shield (Figure 4, Item 10) to front body panel (Figure 4, Item 2) using two screws (Figure 4, Item 4).
8. Place ground rods (Figure 3, Item 2) into stowage location (Figure 3, Item 6) (if not in use) on inside of front body panel (Figure 3, Item 1).
9. Tighten screws (Figure 4, Items 3, 4, and 7) to 87 – 105 in/lb (10 – 12 Nm).
10. Install air cleaner (WP 0020, Service Air Cleaner).
11. Install NATO slave receptacle positive and negative connections (WP 0043, Remove/Install NATO Slave Receptacle).
12. Install top body panel (WP 0029, Remove/Install Top Body Panel).
13. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
14. Close generator set doors.
15. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
16. Start engine and check for proper operation (TM 9-6115-752-10).
17. Repair as required.
18. Dispose of all captured fluids IAW local SOP.

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL REAR BODY PANEL**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Panel, rear (WP 0109, Repair Parts List, Figure 4, Item 42)

Washer, lock, 1/4, ext tooth (WP 0109, Figure 4, Item 40)

**Personnel Required**

91D (1)

Assistant (1)

**References**

WP 0035, Remove/Install Door

WP 0036, Repair Door

WP 0061, Remove/Install Convenience Receptacle

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**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

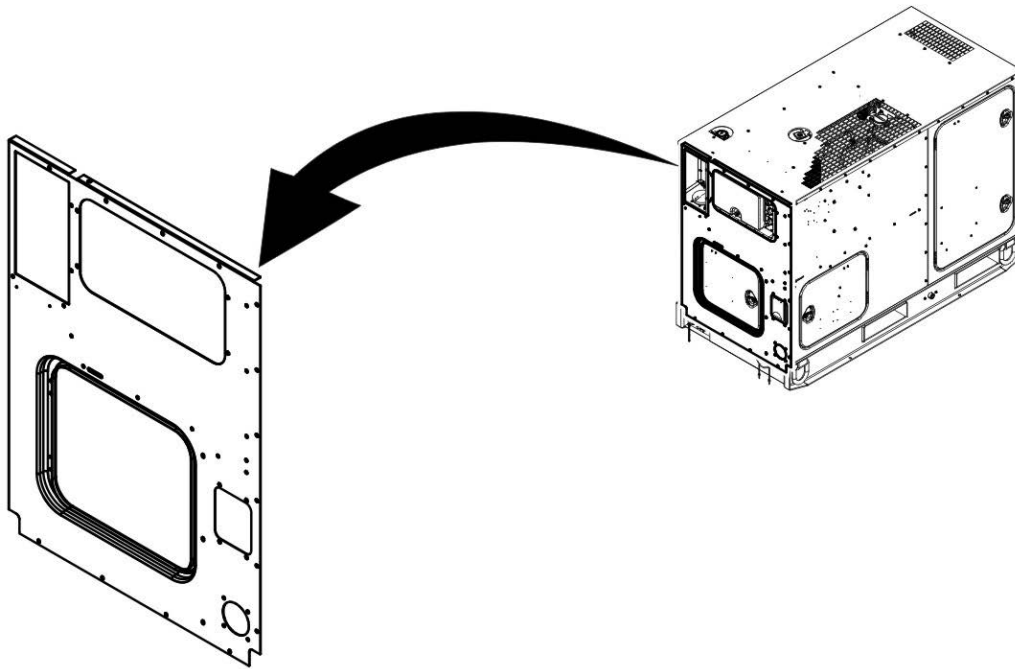
Top body panel removed (WP 0029, Remove/Install Top Body Panel)

DCS removed (WP 0017, Remove/Install DCS)

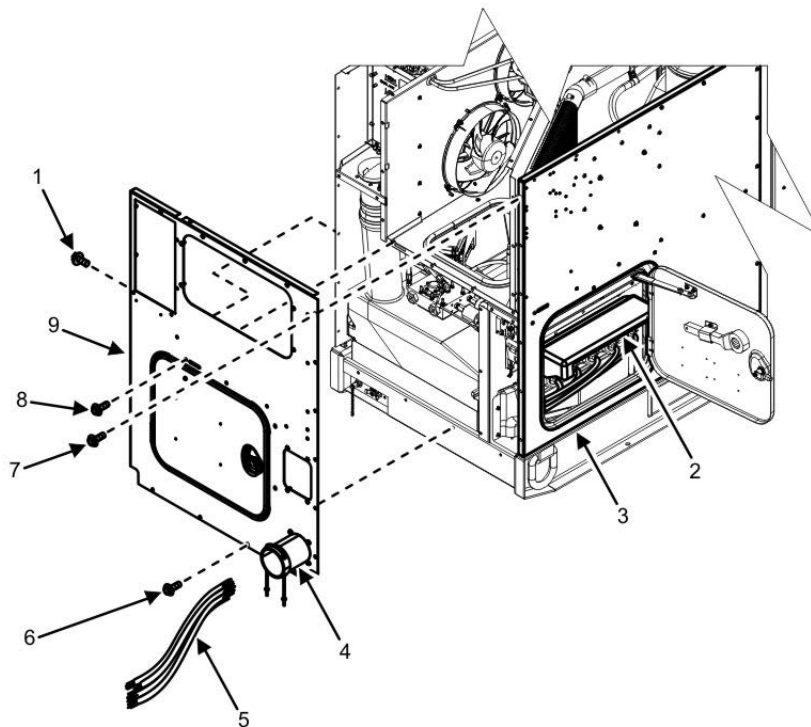
**REMOVE/INSTALL REAR BODY PANEL****Remove Rear Body Panel****NOTE**

Rear access door is attached to rear body panel. Rear body panel may be removed from the unit with or without the door attached. See WP 0035, Remove/Install Door for procedure to remove/install rear access door.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate rear body panel (Figure 1).
3. Inspect rear panel door for damage/proper operation (WP 0035, Remove/Install Door).
4. Repair or replace door as required (WP 0036, Repair Door) (WP 0035, Remove/Install Door).
5. Tag and disconnect all output cables (Figure 2, Item 5) from output box (Figure 2, Item 2) and withdraw output cables (Figure 2, Item 5) through cable outlet (Figure 2, Item 4) (TM 9-6115-752-10).
6. Remove six screws (Figure 2, Item 1) securing left-side body panel to rear body panel (Figure 2, Item 9).
7. Remove six screws (Figure 2, Item 7) securing right-side body panel (Figure 2, Item 3) to rear body panel (Figure 2, Item 9).

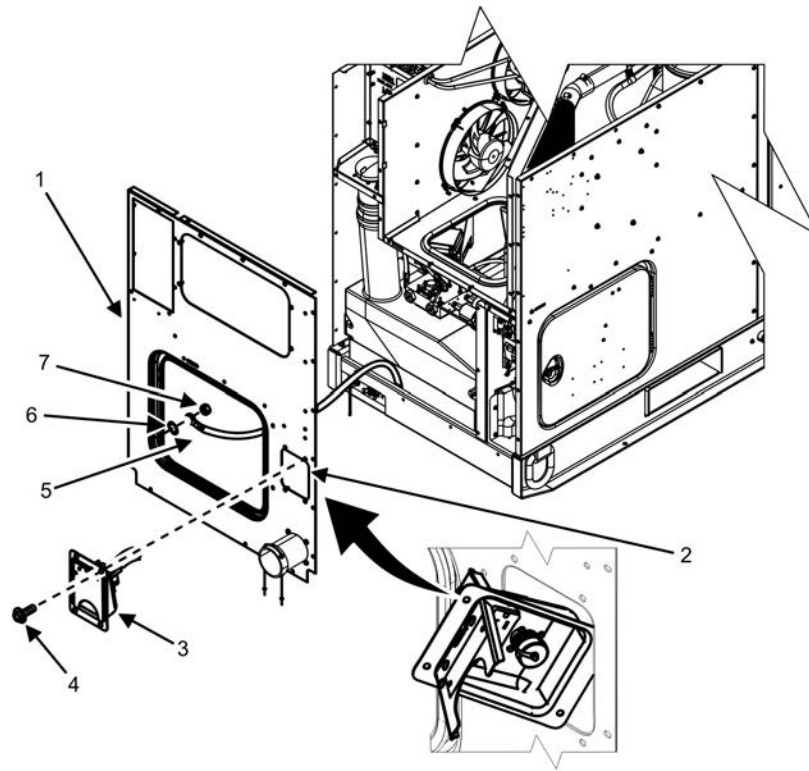


**Figure 1. Rear Body Panel — Location.**



**Figure 2. Rear Body Panel Removal — Detail.**

8. Remove five screws (Figure 2, Item 6) securing rear body panel (Figure 2, Item 9) to bottom of unit.



**Figure 3. Convenience Receptacle Removal — Detail.**

9. Remove four screws (Figure 3, Item 4) securing convenience receptacle (Figure 3, Item 3) to rear body panel (Figure 3, Item 1).
10. Disengage convenience receptacle (Figure 3, Item 3) from rear body panel (Figure 3, Item 1) carefully so as not to damage or stress electrical connections.

### CAUTION

When removing the final screws (Figure 2, Item 8) from the rear body panel (Figure 2, Item 9), be sure to support the rear body panel (Figure 2, Item 8) and not allow it to fall. Failure to comply may cause damage to equipment.

11. Remove 16 screws (Figure 2, Item 8) securing rear body panel (Figure 2, Item 9) to interior body panels.
12. Remove rear body panel (Figure 3, Item 1) from unit, passing convenience receptacle (Figure 3, Item 3) diagonally through receptacle opening (Figure 3, Item 2) in rear body panel (Figure 3, Item 1) as panel is removed.
13. Remove nut (Figure 3, Item 7) and lock washer (Figure 3, Item 6) securing ground wire (Figure 3, Item 5) to rear body panel (Figure 3, Item 1).
14. Discard lock washer (Figure 3, Item 6).
15. Remove ground wire (Figure 3, Item 5) from rear body panel (Figure 3, Item 1).
16. Place rear body panel (Figure 3, Item 1) on suitable work surface.

17. Place convenience receptacle (Figure 3, Item 3) inside unit to prevent damage.

## END OF TASK

### Inspect Rear Body Panel

1. Inspect rear body panel (Figure 3, Item 1) for damage or corrosion.
2. Repair minor damage and corrosion as required.
3. Replace rear body panel (Figure 3, Item 1) if major damage or corrosion are present.
4. Inspect convenience receptacle for damage and replace if damaged (WP 0061, Remove/Install Convenience Receptacle).
5. Inspect all screws (Figure 2, Items 1, 6, 7, and 8) and (Figure 3, Item 4) and replace as required.

## END OF TASK

### Install Rear Body Panel

#### NOTE

The left edge of the rear body panel (Figure 3, Item 1) mounts beneath the edge of the left-side body panel. The right edge of the rear body panel (Figure 3, Item 1) mounts on top of the right-side body panel (Figure 2, Item 3).

1. Place rear body panel (Figure 3, Item 1) on unit, passing convenience receptacle (Figure 3, Item 3) diagonally out through receptacle opening (Figure 3, Item 2) in rear body panel (Figure 3, Item 1).
2. Install ground wire (Figure 3, Item 5), new lock washer (Figure 3, Item 6), and nut (Figure 3, Item 7) to rear body panel (Figure 3, Item 1).
3. Position rear body panel (Figure 3, Item 1) at mounting holes.
4. Install and finger-tighten 16 screws (Figure 2, Item 8) to secure rear body panel (Figure 2, Item 9) to interior panels.
5. Install and finger-tighten four screws (Figure 3, Item 4) securing convenience receptacle (Figure 3, Item 3) to rear body panel (Figure 3, Item 1).
6. Install and finger-tighten five screws (Figure 2, Item 6) securing rear body panel (Figure 2, Item 9) to bottom of unit.
7. Install and finger-tighten six screws (Figure 2, Item 1) securing left-side body panel to rear body panel (Figure 2, Item 9).
8. Install and finger-tighten six screws (Figure 2, Item 7) securing right-side body panel (Figure 2, Item 3) to rear body panel (Figure 2, Item 9).
9. Secure all screws (Figure 2, Items 1, 6, 7, and 8) and (Figure 3, Item 4) tightly.
10. Install all output cables (Figure 2, Item 5) to proper locations in output box (TM 9-6115-752-10).
11. Install DCS control panel (WP 0017, Remove/Install DCS).
12. Install top body panel (WP 0029, Remove/Install Top Body Panel).
13. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
14. Close generator set doors.
15. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
16. Start engine and check for proper operation (TM 9-6115-752-10).

---

17. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**





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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL LEFT-SIDE BODY PANELS**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Panel, left, air intake (WP 0109, Repair Parts List, Figure 4, Item 66)

Panel, left and right door (WP 0109, Figure 4, Item 64)

Washer, lock, 1/4, ext tooth (WP 0109, Figure 4, Item 40)

Grease, electrically conductive (WP 0180, Expendable and Durable Items List, Item 22)

**Personnel Required**

91D (1)

Assistant (1)

**References**

WP 0035, Remove/Install Door

WP 0036, Repair Door

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

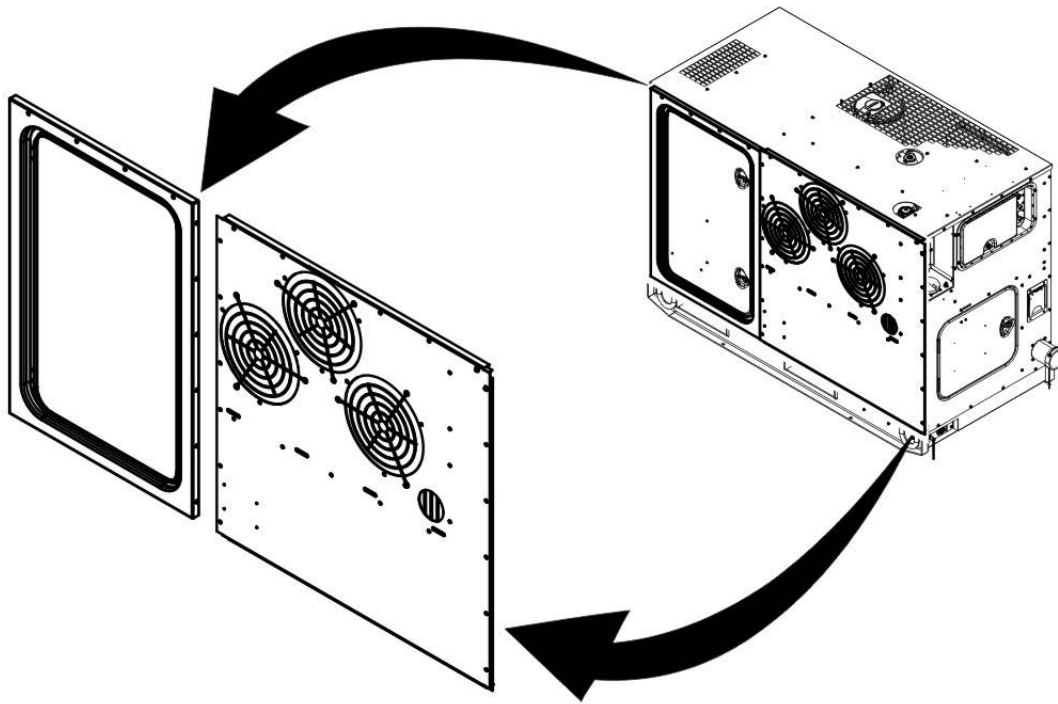
Top body panel removed (WP 0029, Remove/Install Top Body Panel)

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**REMOVE/INSTALL LEFT-SIDE BODY PANELS****WARNING**

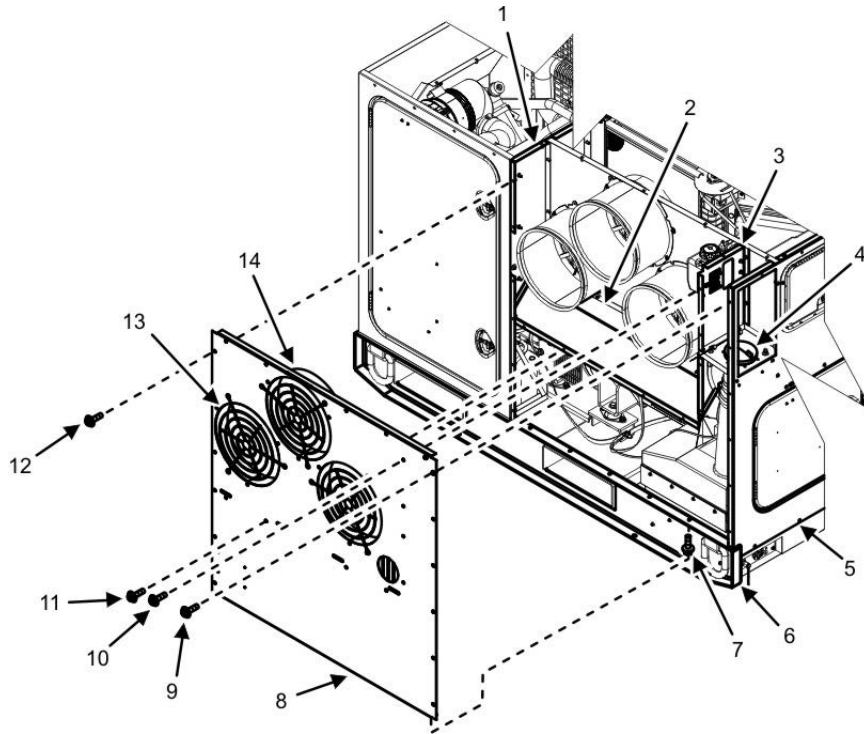
High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

## Remove Left-Side Body Panel



**Figure 1. Left-Side Body Panels — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate left-side body panels (Figure 1).



**Figure 2. Left-Side Body Panel — Removal.**

3. Remove six screws (Figure 2, Item 7) under left-side body panel (Figure 2, Item 8) securing panel to unit skid (Figure 2, Item 6).
4. Remove six screws (Figure 2, Item 9) securing left-side body panel (Figure 2, Item 8) to rear body panel (Figure 2, Item 5).
5. Remove four screws (Figure 2, Item 10) securing left-side body panel (Figure 2, Item 8) to fuel system panel (Figure 2, Item 3) behind fuel filler neck (Figure 2, Item 4).
6. Remove six screws (Figure 2, Item 12) securing left-side body panel (Figure 2, Item 8) to internal bulkhead (Figure 2, Item 1).

### CAUTION

The left-side body panel is not heavy but will bend easily. Handle it with care. Failure to comply may cause damage to equipment.

### NOTE

Three fan shrouds are secured to left-side body panel. Pull the panel straight from unit to ensure easy removal of panel.

7. Remove six screws (Figure 2, Item 11) securing left-side body panel (Figure 2, Item 8) to radiator support panel (Figure 2, Item 2).
8. Remove left-side body panel (Figure 2, Item 8) from unit and place on suitable work surface.

**END OF TASK**

---

**Inspect Left-Side Body Panel**

1. Inspect left-side body panel (Figure 2, Item 8) for damage or corrosion. Repair or replace panel as required.
2. Inspect fan guard (Figure 2, Item 13) for damage and replace as required.
3. Inspect fan shroud (Figure 2, Item 14) for damage and replace as required.
4. Inspect mounting hardware for damage and replace as required.

**END OF TASK****Install Left-Side Body Panel****NOTE**

If left-side door frame is to be removed, do not install left-side body panel. Install the left-side door frame before installing the left-side body panel. The door frame can be installed more easily if left-side body panel is not installed. See Install Left-Side Door Frame task.

Three fan shrouds (Figure 2, Item 14) are secured to left-side body panel (Figure 2, Item 8). Each fan shroud (Figure 2, Item 14) fits snugly over three fan inlet ducts.

1. Position left-side body panel (Figure 2, Item 8) at mounting location on unit.

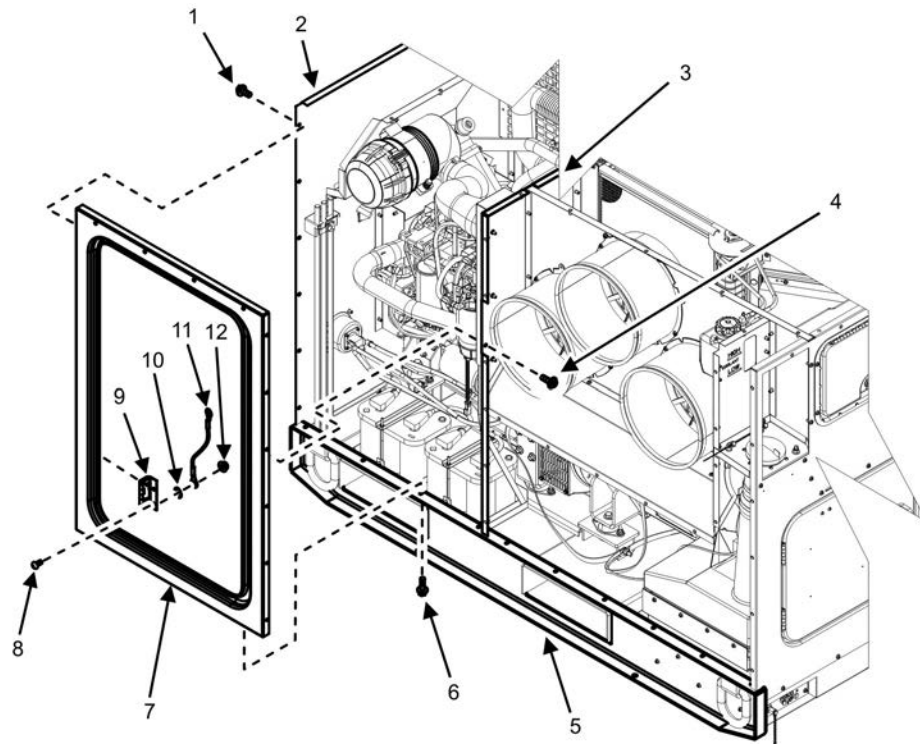
**NOTE**

Body panel screws should be installed finger-tight at first to allow repositioning of panel during installation.

2. Install six screws (Figure 2, Item 12) finger-tight to secure left-side body panel (Figure 2, Item 8) to internal bulkhead (Figure 2, Item 1).
3. Install four screws (Figure 2, Item 10) finger-tight to secure left-side body panel (Figure 2, Item 8) to fuel system panel (Figure 2, Item 3) behind fuel filler neck (Figure 2, Item 3).
4. Install six screws (Figure 2, Item 11) finger-tight to secure left-side body panel (Figure 2, Item 8) to radiator support panel (Figure 2, Item 2).
5. Install six screws (Figure 2, Item 7) finger-tight to secure bottom of left-side body panel (Figure 2, Item 8) to unit skid (Figure 2, Item 6).
6. Install six screws (Figure 2, Item 9) finger-tight to secure left-side body panel (Figure 2, Item 8) to rear body panel (Figure 2, Item 5).
7. Secure all screws installed in left-side body panel (Figure 2, Item 8) tightly.
8. Install top body panel (WP 0029, Remove/Install Top Body Panel).
9. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
10. Close all doors on generator set.

**END OF TASK**

## Remove Left-Side Door Frame



**Figure 3. Left-Side Door Frame — Removal.**

### NOTE

Left-side door is shown removed in Figure 3 for clarity.

Left-side door is attached to left-side door frame. Left-side door frame may be removed from unit with or without left-side door attached. See WP 0035, Remove/Install Door for procedure to remove and install door.

1. Remove left-side body panel if not removed. See Remove Left-Side Body Panel task.
2. Open left-side door.
3. Remove screw (Figure 3, Item 8), two lock washers (Figure 3, Item 10), two ground wires (Figure 3, Item 11), and nut (Figure 3, Item 12) from bottom hinge (Figure 3, Item 9). Discard two lock washers (Figure 3, Item 10).
4. Reinstall screw (Figure 3, Item 9) and nut (Figure 3, Item 12) to bottom hinge (Figure 3, Item 9).
5. Close left-side door.
6. Remove six screws (Figure 3, Item 1) securing left-side door frame (Figure 3, Item 7) to front body panel (Figure 3, Item 2),
7. Remove four screws (Figure 3, Item 6) securing bottom of left-side door frame (Figure 3, Item 7) to unit skid (Figure 3, Item 5).
8. Remove six screws (Figure 3, Item 4) securing left-side door frame (Figure 3, Item 7) to unit internal bulkhead (Figure 2, Item 3).

**END OF TASK**

---

**Inspect Left-Side Door Frame**

1. Inspect left-side door (not shown) and door frame (Figure 3, Item 7) for corrosion or damage and repair or replace as required.
2. Inspect screws (Figure 3, Item 1, 4, 6) for damage and replace as required.

**END OF TASK****Install Left-Side Door Frame****NOTE**

Body panel screws should be installed finger-tight at first to allow repositioning of panel during installation.

The door frame cannot be easily installed if left-side body panel is installed. Remove left-side body panel if necessary. See Remove Left-Side Body Panel task.

1. Position left-side door frame (Figure 3, Item 7) at mounting location and align mounting holes.

**CAUTION**

The front body panel should be installed on top of the left-side door frame edge. Failure to comply may cause damage to equipment.

2. Install six screws (Figure 3, Item 4) finger-tight to secure left-side door frame (Figure 3, Item 7) to the internal bulkhead (Figure 3, Item 3).
3. Install four screws (Figure 3, Item 6) finger-tight to secure left-side door frame (Figure 3, Item 7) to unit skid (Figure 3, Item 5).
4. Install six screws (Figure 3, Item 1) finger-tight to secure left-side door frame (Figure 3, Item 7) to front body panel (Figure 3, Item 2).
5. Secure all screws (Figure 3, Items 1, 4, and 6) in left-side door frame (Figure 3, Item 13) tightly.
6. Open left-side door.
7. Install two ground wires (Figure 3, Item 11) to bottom hinge (Figure 3, Item 9) with screw (Figure 3, Item 8), two new lock washers (Figure 3, Item 10), and nut (Figure 3, Item 12).
8. Install top body panel (WP 0029, Remove/Install Top Body Panel).
9. Install left-side body panel. See Install Left-Side Body Panel task.
10. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
11. Close left-side door.

**END OF TASK****END OF WORK PACKAGE**

---

**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL RIGHT-SIDE BODY PANELS**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Panel, left and right door (WP 0109, Repair Parts List, Figure 4, Item 64)

Panel, right, output box (WP 0109, Figure 4, Item 51)

Washer, lock, 1/4, ext tooth (2) (WP 0109, Figure 4, Item 40)

Grease, electrically conductive (WP 0180, Expendable and Durable Items List, Item 22)

**Personnel Required**

91D (1)

Assistant (1)

**References**

WP 0035, Remove/Install Door

**References**

WP 0036, Repair Door

WP 0070, Remove/Install Coalescer

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

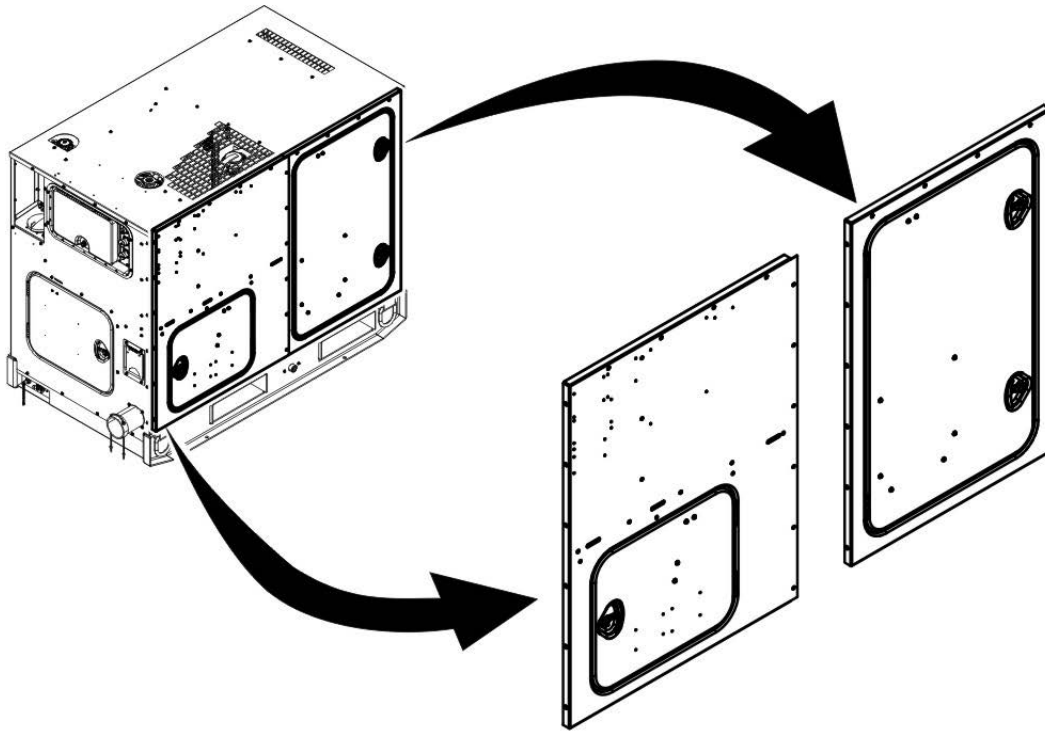
Top body panel removed (WP 0029, Remove/Install Top Body Panel)

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**REMOVE/INSTALL RIGHT-SIDE BODY PANELS****WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- The NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.

## Remove Right-Side Body Panel



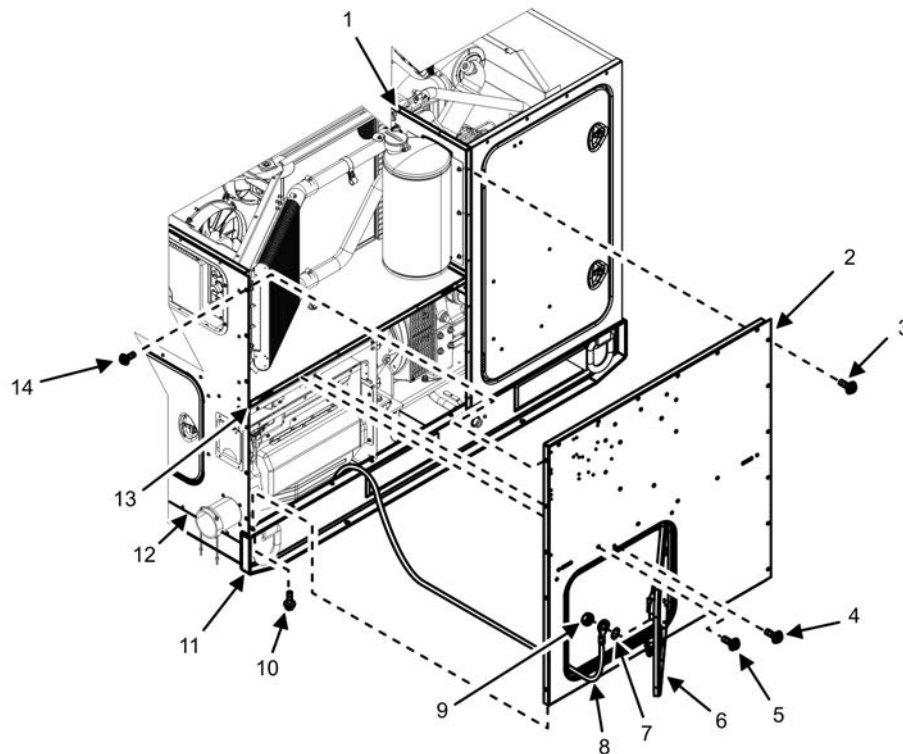
**Figure 1. Right-Side Body Panel and Door Frame — Location.**

### NOTE

Output terminal door is attached to right-side body panel (Figure 1). Right-side body panel may be removed from the unit with or without door attached. (See WP 0035, Remove/Install Door for procedure to remove/install unit access doors.) Figure 2 shows the right-side body panel with the door attached.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate right-side body panel and door frame (Figure 1).
3. Ensure output box door (Figure 2, Item 6) is closed.
4. Remove coalescer cover from right-side body panel (WP 0070, Remove/Install Coalescer).
5. Remove flange bolts and nuts securing coalescer to right-side body panel (WP 0070, Remove/Install Coalescer).





**Figure 2. Right-Side Body Panel — Removal.**

6. Remove six screws (Figure 2, Item 14) securing rear body panel (Figure 2, Item 12) to right-side body panel (Figure 2, Item 2).
7. Remove six screws (Figure 2, Item 10) securing right-side body panel (Figure 2, Item 2) to unit skid (Figure 2, Item 11).
8. Remove nine screws (Figure 2, Items 4 and 5) securing right-side body panel (Figure 2, Item 2) to radiator support panel (Figure 2, Item 13) and output box.
9. Remove six screws (Figure 2, Item 3) securing right edge of right-side body panel (Figure 2, Item 2) to interior bulkhead panel (Figure 2, Item 1).
10. Open output box door (Figure 2, Item 6).
11. Remove nut (Figure 2, Item 9) and lock washer (Figure 2, Item 7) securing ground wire (Figure 2, Item 8) to output box door (Figure 2, Item 6).
12. Discard lock washer (Figure 2, Item 7).
13. Remove ground wire (Figure 2, Item 8) from right-side body panel (Figure 2, Item 2).
14. Remove right-side body panel (Figure 2, Item 2) from unit and place on a suitable work surface.

## **END OF TASK**

### **Inspect Right-Side Body Panel**

1. Inspect right-side body panel (Figure 2, Item 2) for damage or corrosion.
2. Repair minor damage or corrosion as required.
3. Replace right-side body panel (Figure 2, Item 2) if substantial damage or corrosion is present.

4. Inspect right-side output box door (Figure 2, Item 6) for damage and proper operation. Repair or replace as required.

## END OF TASK

### Install Right-Side Body Panel

#### NOTE

Install the right-side door frame before installing the right-side body panel. The door frame can be more easily installed if right-side body panel is not installed. See Install Right-Side Door Frame task.

The left-hand edge overlap of right-side body panel mounts under the rear body panel for installation.

1. Position right-side body panel (Figure 2, Item 2) on unit and align mounting holes.
2. Install and finger-tighten six screws (Figure 2, Item 3) securing right-side body panel (Figure 2, Item 2) to unit interior bulkhead panel (Figure 2, Item 1).
3. Install and finger-tighten nine screws (Figure 2, Items 4 and 5) securing right-side body panel (Figure 2, Item 2) to radiator support panel (Figure 2, Item 13) and output box.
4. Install and finger-tighten six screws (Figure 2, Item 10) securing right-side body panel (Figure 2, Item 2) to unit skid (Figure 2, Item 11).
5. Install and finger-tighten six screws (Figure 2, Item 14) securing right-side body panel (Figure 2, Item 2) to rear body panel (Figure 2, Item 12).
6. Secure all screws (Figure 2, Item 3, 4, 5, 9, and 13) installed in right-side body panel (Figure 2, Item 2).
7. Verify correct operation of output box door (Figure 2, Item 6) on right-side panel and door (Figure 3, Item 6) on right-side door frame (Figure 3, Item 6).
8. Install flange bolts and nuts securing coalescer to right-side body panel (WP 0070, Remove/Install Coalescer).
9. Install coalescer cover to right-side body panel (WP 0070, Remove/Install Coalescer).
10. Install top body panel (WP 0029, Remove/Install Top Body Panel).
11. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
12. Close generator set doors.
13. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
14. Start engine and check for proper operation (TM 9-6115-752-10).
15. Check coalescer for leaks and proper operation, and repair as required.

## END OF TASK

## Remove Right-Side Door Frame

### NOTE

To aid in disassembly, the right-side body panel (Figure 2, Item 2) should be removed before removing the right-side door frame (Figure 3, Item 9).

Engine access door is attached to right-side door frame (Figure 2). Right-side door frame may be removed from the unit with or without door attached. See WP 0036, Repair Door for procedure to remove/install unit access doors.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove right-side body panel. See Remove Right-Side Body Panel task.

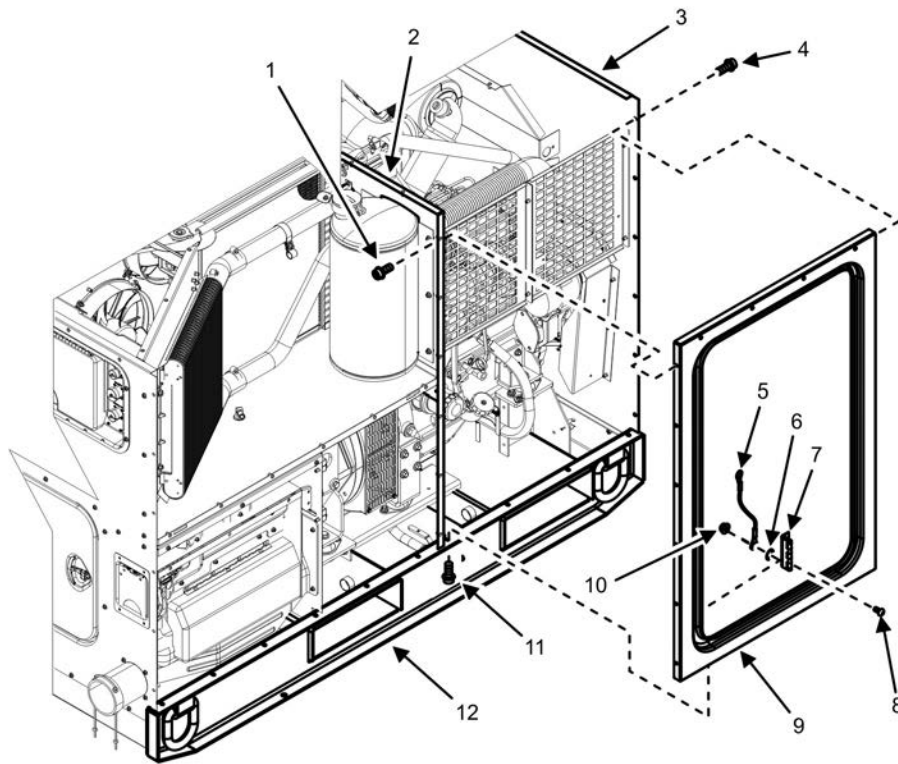


Figure 3. Right-Side Door Frame — Removal.

### NOTE

Right-side door is shown removed in Figure 3 for clarity.

3. Open right-side door.
4. Remove screw (Figure 3, Item 8), two lock washers (Figure 3, Item 6), two ground wires (Figure 3, Item 5), and nut (Figure 3, Item 10) from bottom hinge (Figure 3, Item 7). Discard two lock washers (Figure 3, Item 6).
5. Reinstall screw (Figure 3, Item 8) and nut (Figure 3, Item 10) to bottom hinge (Figure 3, Item 7).
6. Close right-side door.
7. Remove four screws (Figure 3, Item 11) securing right-side door frame (Figure 3, Item 9) to unit skid (Figure 3, Item 12).

8. Remove six screws (Figure 3, Item 1) securing right-side door frame (Figure 3, Item 9) to inside edge of internal bulkhead panel (Figure 3, Item 2).
9. Remove six screws (Figure 3, Item 4) securing right edge of right-side door frame (Figure 3, Item 9) to front body panel (Figure 3, Item 3).
10. Remove right-side door frame (Figure 3, Item 9) and door (if installed) and place on a suitable work surface.

#### **END OF TASK**

#### **Inspect Right-Side Door Frame**

1. Inspect right-side door frame (Figure 3, Item 9) and door (not shown) for damage.
2. Replace or repair door as required (WP 0035, Remove/Install Door and WP 0036, Repair Door).

#### **END OF TASK**

#### **Install Right-Side Door Frame**

#### **NOTE**

Right-side door frame (Figure 3, Item 9) cannot be installed to unit if right-side body panel (Figure 2, Item 2) is already installed. See Remove Right-Side Body Panel task.

1. Position right-side door frame (Figure 3, Item 9) and door (not shown) on unit and align mounting holes.
2. Install and finger-tighten six hex screws (Figure 3, Item 1) securing right-side door frame (Figure 3, Item 9) to internal bulkhead panel (Figure 3, Item 2).
3. Install and finger-tighten four screws (Figure 3, Item 11) securing right-side door frame (Figure 3, Item 9) to unit skid (Figure 3, Item 12).

#### **NOTE**

The edge of the right-side door frame should be mounted beneath the front body panel.

4. Install six screws (Figure 3, Item 4) securing right edge of right-side door frame (Figure 3, Item 9) to front body panel (Figure 3, Item 3).
5. Secure all screws (Figure 3, Items 1, 4, and 11) installed in right-side door frame (Figure 3, Item 9).
6. Open right-side door.
7. Install screw (Figure 3, Item 8), two new lock washers (Figure 3, Item 6), two wires (Figure 3, Item 5), and nut (Figure 3, Item 10) to bottom hinge (Figure 3, Item 7).
8. Close right-side door.
9. Install right-side body panel. See Install Right-Side Body Panel task.
10. Verify correct operation of output box door (Figure 2, Item 6) on right-side panel and right-side door frame.
11. Install top body panel (WP 0029, Remove/Install Top Body Panel).
12. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
13. Close generator set doors.
14. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
15. Start engine and check for proper operation (TM 9-6115-752-10).

16. Check coalescer for leaks and proper operation. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL INTERIOR BODY PANELS**

---

**INITIAL SETUP****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Bracket, mounting, right side (WP 0109, Repair Parts List, Figure 4, Item 73)

Crossmember, enclosure (WP 0109, Figure 4, Item 76)

Panel, air, fan (WP 0109, Figure 4, Item 70)

Panel, radiator (WP 0109, Figure 4, Item 75)

Panel, support, fuel shroud (WP 0109, Figure 4, Item 71)

Antifreeze, ethylene glycol (WP 0180, Expendable and Durable Items List, Item 2)

Cap set, protective (WP 0180, Item 8)

Grease, electrically conductive (WP 0180, Item 22)

Pan, drain (WP 0180, Item 30)

Rag, wiping (3) (WP 0180, Item 33)

**Personnel Required**

91D (1)

Assistant (1)

**References**

WP 0021, Remove/Install Charge Air Cooler

WP 0022, Service Cooling System

WP 0024, Remove/Install Cooling Fans

WP 0025, Remove/Install Radiator Hose and Tube Assemblies

WP 0028, Remove/Install Radiator Assembly

**References**

WP 0033, Remove/Install Right-Side Body Panels

WP 0039, Remove/Install Engine Wiring Harness

WP 0042, Remove/Install Intake Air Heater Relay

WP 0047, Remove/Install Fuel Filter/Water Separator

WP 0050, Remove/Install Fuel Cooler

WP 0070, Remove/Install Coalescer

WP 0081, Remove/Install Engine ECM

WP 0084, Remove/Install Muffler

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Top body panel removed (WP 0029, Remove/Install Top Body Panel)

Rear body panel removed (WP 0031, Remove/Install Rear Body Panel)

Left-side body panel removed (WP 0032, Remove/Install Left-Side Body Panels)

Fuel filler neck removed from fuel system bracket (WP 0054, Remove/Install Fuel Tank Filler Neck)

Coolant recovery bottle removed (WP 0023, Remove/Install Coolant Recovery System)

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**REMOVE/INSTALL INTERIOR BODY PANELS**

**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

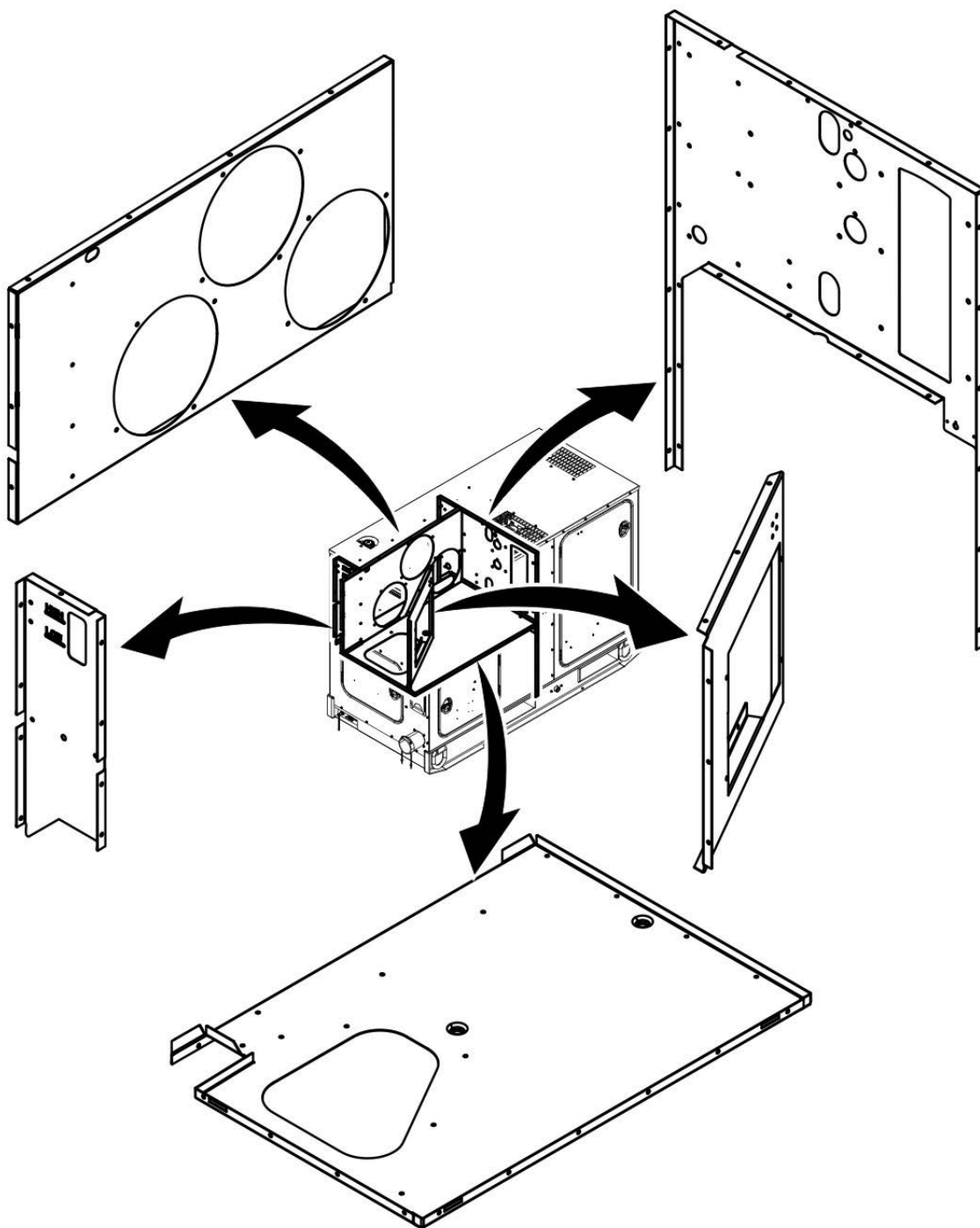


Figure 1. Interior Body Panel — Locations.



## Remove Fuel System Panel

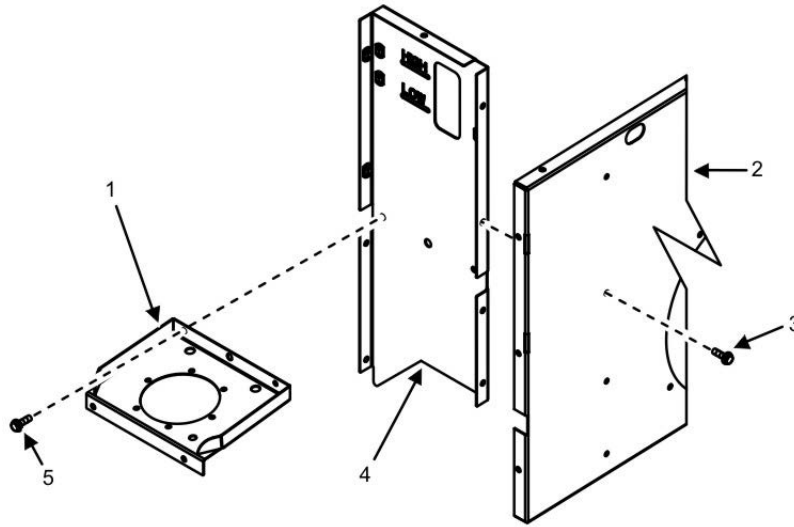


Figure 2. Fuel System Panel — Removal.

### CAUTION

Individual interior panels (Figure 1) must be removed and installed in sequence as written in this WP and installed in reverse sequence. Failure to comply may cause damage to equipment.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove four screws (Figure 2, Item 3) securing fan support panel (Figure 2, Item 2) to fuel system panel (Figure 2, Item 4).
3. Remove two screws (Figure 2, Item 5) securing fuel system bracket (Figure 2, Item 1) to fuel system panel (Figure 2, Item 4).
4. Remove fuel system panel (Figure 2, Item 4) from unit.

### END OF TASK

## Inspect Fuel System Panel

1. Inspect fuel system panel (Figure 2, Item 4) for cracks, damage from heat, and other signs of damage. Replace as required.
2. Inspect screws (Figure 2, Items 3 and 5) used to secure fuel system panel (Figure 2, Item 4) for damage or wear. Replace as required.
3. Inspect fuel system bracket (Figure 2, Item 1) for cracks, damage from heat, and other signs of damage. Replace as required.

### END OF TASK

## Install Fuel System Panel

1. Position fuel system panel (Figure 2, Item 4) in unit, ensuring proper orientation.
2. Secure fuel system panel (Figure 2, Item 4) behind fuel filler cap (not shown) to fan support panel (Figure 2, Item 2) by installing four screws (Figure 2, Item 3) through fan support panel (Figure 2, Item 2) finger-tight.

3. Secure fuel system bracket (Figure 2, Item 1) to fuel system panel (Figure 2, Item 4) to by installing two screws (Figure 2, Item 5) finger-tight.
4. Tighten all screws (Figure 2, Items 3 and 5) installed in steps 2 and 3.
5. Install fuel tank filler neck to fuel system bracket (WP 0054, Remove/Install Fuel Tank Filler Neck).
6. Install coolant overflow bottle (WP 0023, Remove/Install Coolant Recovery System).
7. Install left-side body panel (WP 0032, Remove/Install Left-Side Body Panel).
8. Install rear body panel (WP 0031, Remove/Install Rear Body Panel).
9. Install top body panel (WP 0029, Remove/Install Top Body Panel).
10. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
11. Close generator set doors.
12. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
13. Start engine and check for proper operation of cooling fans (TM 9-6115-752-10).
14. Repair as required.

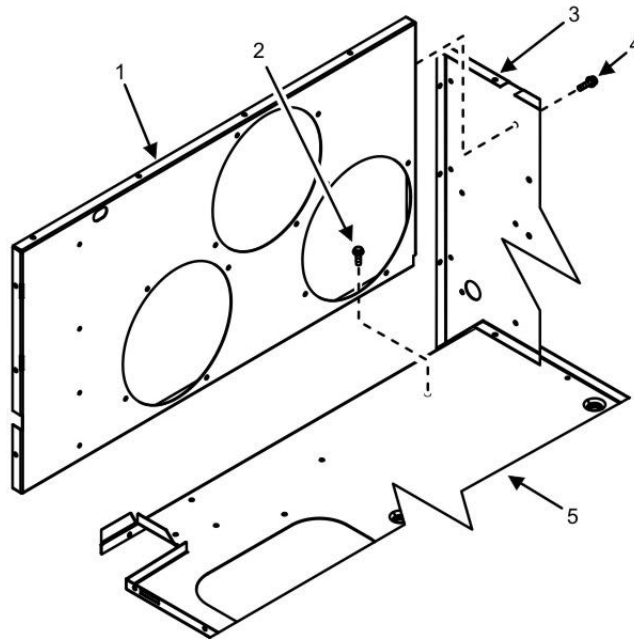
**END OF TASK**

**Remove Fan Support Panel**

**CAUTION**

Individual interior panels (Figure 1) must be removed and installed in sequence as written in this WP and installed in reverse sequence. Failure to comply may cause damage to equipment.

1. Remove fuel system panel. See Remove Fuel System Panel task.



**Figure 3. Fan Support Panel — Removal.**

2. Remove three cooling fans and inlet ducts from fan support panel (Figure 3, Item 1) (WP 0024, Remove/Install Cooling Fans).
3. Remove three screws (Figure 3, Item 4) securing fan support panel (Figure 3, Item 1) to bulkhead panel (Figure 2, Item 3).
4. Remove three screws (Figure 3, Item 2) securing fan support panel (Figure 3, Item 1) to radiator support panel (Figure 3, Item 5).

### **WARNING**

The component being lifted weighs 39 lb (17.7 kg). Two persons or a suitable lifting device are necessary to lift component. Failure to comply may cause injury or death to personnel.

5. Remove fan support panel (Figure 3, Item 1) from unit and place on suitable work surface.

### **END OF TASK**

#### **Inspect Fan Support Panel**

1. Inspect fan support panel (Figure 3, Item 1) for cracks, damage from heat, and other signs of damage. Replace as required.
2. Inspect screws (Figure 3, Items 2 and 4) used to secure fan support panel (Figure 3, Item 1) for damage or wear. Replace as required.

### **END OF TASK**

## Install Fan Support Panel

1. Position fan support panel (Figure 3, Item 1) in unit, ensuring proper orientation.

### NOTE

Brace the fan support panel (Figure 3, Item 1) while installing screws (Figure 3, Items 2 and 4) securing it to bulkhead panel (Figure 3, Item 3) and radiator support panel (Figure 3, Item 5).

2. Secure fan support panel (Figure 3, Item 1) to radiator support panel (Figure 3, Item 5) by installing three screws (Figure 3, Item 2) finger-tight.
3. Secure fan support panel (Figure 3, Item 1) to bulkhead panel (Figure 3, Item 3) by installing three screws (Figure 3, Item 4) finger-tight.
4. Install three cooling fans and inlet ducts (WP 0024, Remove/Install Cooling Fans).
5. Install fuel system panel. See Remove Fuel System Panel task.

## END OF TASK

## Remove Cooler Support Panel

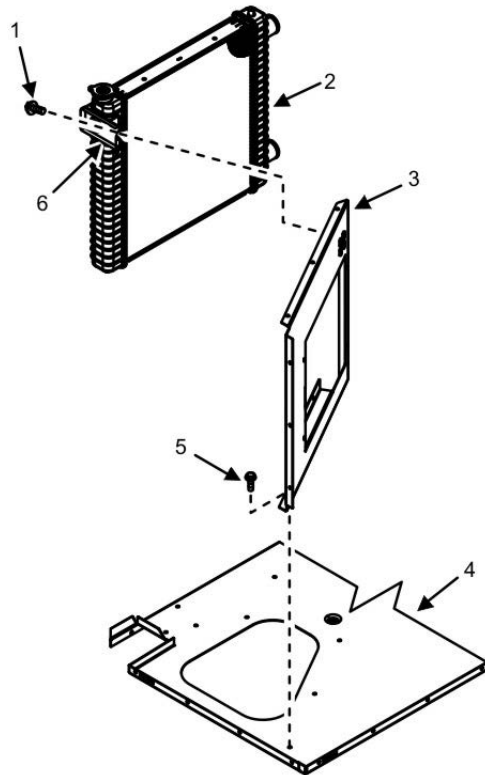


Figure 4. Cooler Support Panel — Removal.

### CAUTION

Individual interior panels (Figure 1) must be removed and installed in sequence as written in this WP and installed in reverse sequence. Failure to comply may cause damage to equipment.

1. Remove fuel system panel. See Remove Fuel System Panel task.

2. Remove fan support panel. See Remove Fan Support Panel task.
3. Remove right-side body panel (WP 0033, Remove/Install Right-side Body Panels).
4. Remove charge air cooler (WP 0021, Remove/Install Charge Air Cooler) (not shown) from cooler support panel (Figure 4, Item 3).

### NOTE

Capture all spilled fluids IAW local SOP. Cap/plug all open lines and fittings to prevent dirt or debris from entering engine.

5. Remove fuel cooler (WP 0050, Remove/Install Fuel Cooler) from cooler support panel (Figure 4, Item 3).
6. Remove two screws (Figure 4, Item 1) securing cooler support panel (Figure 4, Item 3) to radiator rear mounting bracket (Figure 4, Item 6).

### CAUTION

The radiator (Figure 4, Item 2) is easily damaged. Carefully prop or otherwise support the radiator (Figure 4, Item 2) close to its original position in the upper rear of the generator set to prevent damage to the inlet and outlet connections and/or the radiator fins. Failure to comply may cause damage to equipment.

7. Remove two screws (Figure 4, Item 5) securing cooler support panel (Figure 4, Item 3) to radiator support panel (Figure 4, Item 4).
8. Remove cooler support panel (Figure 4, Item 3) from unit and place on a suitable work surface.

### END OF TASK

#### Inspect Cooler Support Panel

1. Inspect cooler support panel (Figure 4, Item 3) for corrosion, cracks, or other damage. Replace as required.
2. Inspect screws (Figure 4, Items 1 and 5) for signs of damage and replace as required.
3. Inspect clinch nuts (not shown) on rear of cooler support panel (Figure 4, Item 3) for signs of damage and replace cooler support panel (Figure 4, Item 3) as required.
4. Inspect rubber edge bulb seal (not shown) on cooler support panel (Figure 4, Item 3) at radiator (Figure 4, Item 2) for cracks or other damage. Replace as required.

### END OF TASK

#### Install Cooler Support Panel

1. Install rubber edge bulb seal (not shown) on cooler support panel (Figure 4, Item 3) if removed.
2. Place cooler support panel (Figure 4, Item 3) at mounting location inside unit at radiator (Figure 4, Item 2).
3. Install two screws (Figure 4, Item 5) to secure cooler support panel (Figure 4, Item 3) to radiator support panel (Figure 4, Item 4) finger-tight.
4. Install two screws (Figure 4, Item 1) securing rear radiator support bracket (Figure 4, Item 6) to cooler support panel (Figure 4, Item 3) finger-tight.
5. Remove support from radiator (Figure 4, Item 2).
6. Tighten screws installed in steps 3 and 4.
7. Install fuel cooler (WP 0050, Remove/Install Fuel Cooler).

8. Install charge air cooler (WP 0021, Remove/Install Charge Air Cooler).
9. Install right-side body panel (WP 0033, Remove/Install Right-Side Body Panels).
10. Install fan support panel. See Install Fan Support Panel task.
11. Install fuel system panel. See Install Fuel System Panel task.

## END OF TASK

### Remove Radiator Support Panel

#### CAUTION

Individual interior panels (Figure 1) must be removed and installed in sequence as written in this WP and installed in reverse sequence. Failure to comply may cause damage to equipment.

1. Remove fuel system panel. See Remove Fuel System Panel task.
2. Remove fan support panel. See Remove Fan Support Panel task.
3. Remove cooler support panel. See Remove Cooler Support Panel task.
4. Remove charge air cooler air tubes (WP 0021, Remove/Install Charge Air Cooler).
5. Drain cooling system (WP 0022, Service Cooling System).
6. Disconnect radiator hoses from radiator (WP 0025, Remove/Install Radiator Hose and Tube Assemblies).
7. Remove radiator (WP 0028, Remove/Install Radiator Assembly).
8. Remove two hose clips (Figure 5, Item 4) and two coalescer drain hoses (Figure 5, Item 5) from coalescer hose fitting (Figure 5, Item 3) on top and underside of radiator support panel (Figure 5, Item 6).

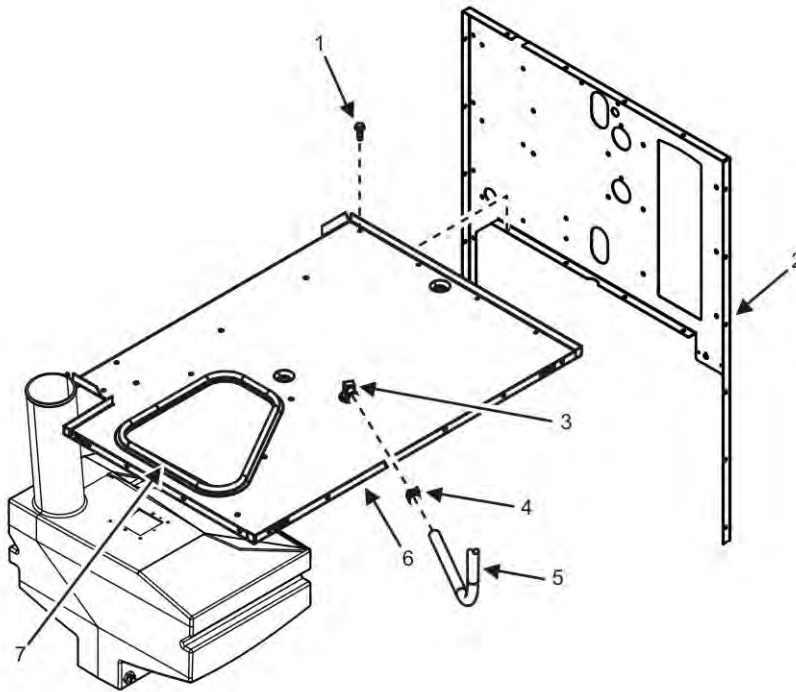


Figure 5. Radiator Support Panel — Removal.

9. Push DCS and cooling fan wiring harnesses (not shown) through cut-out in radiator support panel (Figure 5, Item 7) and into bottom of unit skid.
10. Remove four screws (Figure 5, Item 1) securing radiator support panel (Figure 5, Item 6) to bulkhead panel (Figure 5, Item 2).

### CAUTION

The radiator support panel (Figure 5, Item 6) is not very heavy but is large and cumbersome. Assistance may be required to lift it from the generator set. Failure to comply may cause damage to equipment.

11. Lift radiator support panel (Figure 5, Item 6) from unit.

### NOTE

Five P-clamps (not shown) supporting wiring harness and fuel lines are located along the underside of the radiator support panel (Figure 5, Item 6). The five P-clamps must be removed and the wiring harness and fuel lines lowered to the base of the unit before removal of the radiator support panel (Figure 5, Item 6). Take note of the location of the P-clamps so the P-clamps can be installed at the same location when the radiator support panel (Figure 5, Item 6) is re-installed.

12. Remove five screws (not shown) supporting five P-clamps (not shown) along underside of radiator support panel (Figure 5, Item 6).
13. Remove radiator support panel (Figure 5, Item 6) from unit and place on a suitable work surface.

### NOTE

Two wrenches are needed to remove the coalescer hose fitting (Figure 5, Item 3) from the radiator support panel (Figure 5, Item 6).

14. Remove coalescer hose fitting (Figure 5, Item 3) from radiator support panel (Figure 5, Item 6).
15. Inspect coalescer hose fitting (Figure 5, Item 3) for signs of obvious damage. Replace damaged coalescer hose fitting (Figure 5, Item 3) as required.

### END OF TASK

#### Inspect Radiator Support Panel

1. Inspect radiator support panel (Figure 5, Item 6) for cracks, corrosion, damage from heat, or other signs of damage.
2. Repair or replace radiator support panel (Figure 5, Item 6) as required.

### END OF TASK

#### Install Radiator Support Panel

### NOTE

Two wrenches are needed to install the coalescer hose fitting (Figure 5, Item 3) to the radiator support panel (Figure 5, Item 6).

1. Install coalescer hose fitting (Figure 5, Item 3) to radiator support panel (Figure 5, Item 6).

## CAUTION

The radiator support panel (Figure 5, Item 6) is not very heavy but is large and cumbersome. Assistance may be required to lift it into its mounting position in the generator set. Failure to comply may cause damage to equipment.

2. Position radiator support panel (Figure 5, Item 6) to mounting location in generator set.

## NOTE

Five P-clamps (not shown) supporting wiring harness (not shown) and fuel lines (not shown) are located along the underside of the radiator support panel (Figure 5, Item 6). Install the P-clamps (not shown) using five screws (not shown) to noted locations along the underside of the radiator support panel (Figure 5, Item 6).

3. Install four screws (Figure 5, Item 1) securing radiator support panel (Figure 5, Item 6) to bulkhead panel (Figure 5, Item 2) finger-tight.
4. Pull DCS and cooling fan wiring harnesses (not shown) up through cut-out in radiator support panel (Figure 5, Item 7) and rest on radiator support panel (Figure 5, Item 6).
5. Install one coalescer drain hose (Figure 5, Item 5) to top and bottom of coalescer hose fitting (Figure 5, Item 3) on radiator support panel (Figure 5, Item 6).
6. Secure two drain hoses (Figure 5, Item 5) with two hose clips (Figure 5, Item 4).
7. Tighten screws (Figure 5, Item 1) installed in step 3.
8. Install radiator (WP 0028, Remove/Install Radiator Assembly).
9. Install radiator hoses (WP 0025, Remove/Install Radiator Hose and Tube Assemblies) to radiator.
10. Fill cooling system (WP 0022, Service Cooling System).
11. Install charge air cooler air tubes (WP 0021, Remove/Install Charge Air Cooler).
12. Install cooler support panel. See Remove Cooler Support Panel task.
13. Install fan support panel. See Remove Fan Support Panel task.
14. Install fuel system panel. See Remove Fuel System Panel task.
15. Check and re-fill cooling system (WP 0022, Service Cooling System).

## END OF TASK

### Remove Bulkhead Panel

## CAUTION

Individual interior panels (Figure 1) must be removed and installed in sequence as written in this work package and installed in reverse sequence. Failure to comply may cause damage to equipment.

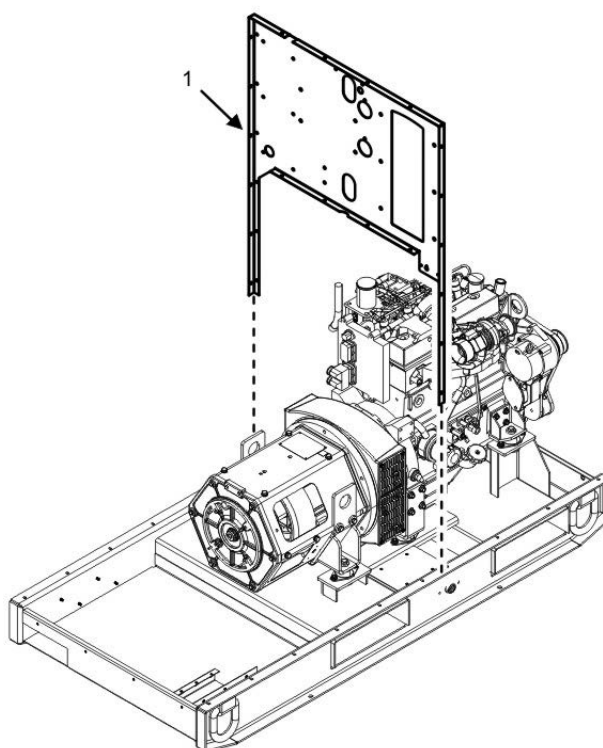
1. Remove fuel system panel. See Remove Fuel System Panel task.
2. Remove fan support panel. See Remove Fan Support Panel task.
3. Remove cooler support panel. See Remove Cooler Support Panel task.
4. Remove radiator support panel. See Remove Radiator Support Panel task.



## CAUTION

After removing several exterior and interior body panels, the bulkhead has only minimal support. Assistance may be required to support bulkhead panel during removal. Proceed with bulkhead removal carefully. Failure to comply may cause damage to equipment.

5. Remove air plenum supporting fuel filter/water separator and manifold to bulkhead (WP 0047, Remove Fuel Filter/Water Separator Assembly). Allow fuel filter/water separator and manifold attached to air plenum to rest in unit skid.
6. Remove engine Electronic Control Module (ECM) from bulkhead panel (WP 0081, Remove/Install Engine ECM). Allow engine ECM to rest in unit skid.
7. Remove intake air heater solenoid from bulkhead panel (WP 0042, Remove/Install Intake Air Heater Relay). Allow intake air heater solenoid to rest in unit skid.



**Figure 6. Bulkhead Panel — Removal.**

8. Remove exhaust heat shield and muffler from bulkhead panel (Figure 6, Item 1) (WP 0084, Remove/Install Muffler).
9. Remove dead crack switch from bulkhead panel (Figure 6, Item 1) (WP 0039, Remove/Install Engine Wiring Harness).
10. Remove charge air cooler tubes and hoses (WP 0021, Remove/Install Charge Air Cooler).
11. Pull coalescer supply hose through bulkhead panel (Figure 6, Item 1), into engine compartment.
12. Remove four screws that secure bulkhead panel (Figure 6, Item 1) to left-side door frame (WP 0032, Remove/Install Left-Side Body Panels).
13. Remove four screws that secure bulkhead panel (Figure 6, Item 1) to right-side door frame (WP 0033, Remove/Install Right-Side Body Panels).

- 
14. Lift bulkhead panel (Figure 6, Item 1) from unit and place on suitable work surface.

**END OF TASK****Inspect Bulkhead Panel**

1. Inspect bulkhead panel (Figure 6, Item 1) for cracks, corrosion, heat damage, or other damage.
2. Repair or replace bulkhead panel (Figure 6, Item 1) as required.

**END OF TASK****Install Bulkhead Panel**

1. Position bulkhead panel (Figure 6, Item 1) inside generator set, ensuring proper orientation.

**CAUTION**

Assistance may be required to support bulkhead panel during installation. Bulkhead panel has very little support until several other panels and/or components are attached to it. Proceed with bulkhead installation carefully. Failure to comply may cause damage to equipment.

2. Install intake air heater solenoid to bulkhead panel (WP 0042, Remove/Install Intake Air Heater Relay).
3. Install engine ECM to bulkhead panel (WP 0081, Remove/Install Engine ECM).
4. Install air plenum with fuel filter/water separator and manifold attached to bulkhead panel (WP 0048, Remove Fuel Filter/Water Separator Assembly).
5. Install left-side door frame (WP 0032, Remove/Install Left-Side Body Panel).
6. Install right-side door frame (WP 0033, Remove/Install Right-Side Body Panels).
7. Install muffler (WP 0084, Remove/Install Muffler).
8. Install radiator support panel. See Install Radiator Support Panel task.
9. Install cooler support panel. See Install Cooler Support Panel task.
10. Install cooler support panel. See Install Cooler Support Panel task.
11. Install fuel system panel. See Install Fuel System Panel task.

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL DOOR**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Brace, door stay, bottom (WP 0109, Repair Parts List, Figure 4, Item 24)

Brace, door stay, top (WP 0109, Figure 4, Item 23)

Bracket, door stay (WP 0109, Figure 4, Item 19)

Bracket, door stay, small (WP 0109, Figure 4, Item 32)

Bracket, output box door stay (WP 0109, Figure 4, Item 43)

Door assembly (WP 0109, Figure 4, Item 30)

Door assembly, right and left (2) (WP 0109, Figure 4, Item 54)

Door, output box assembly (WP 0109, Figure 4, Item 48)

**Materials/Parts**

Link, door (WP 0109, Figure 4, Item 21)

Washer, lock, 1/4, ext tooth (2) (WP 0109, Figure 4, Item 40)

Grease, electrically conductive (WP 0180, Expendable and Durable Items List, Item 22)

**Personnel Required**

91D (1)

**References**

WP 0036, Repair Door

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

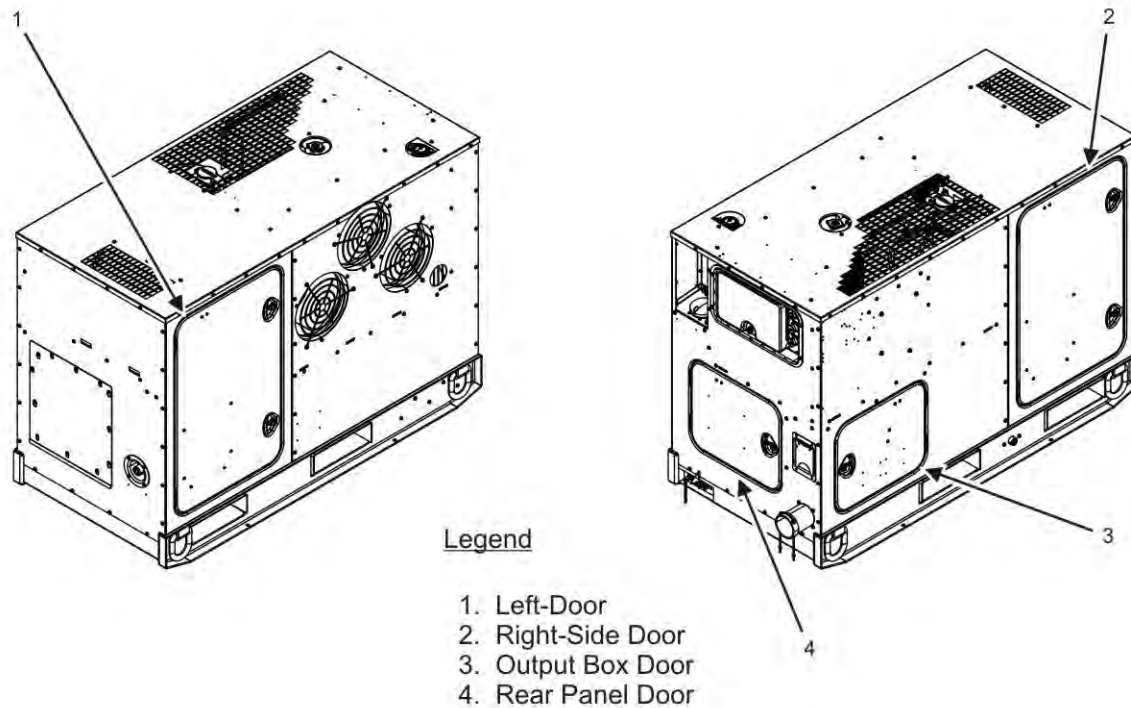
Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

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**REMOVE/INSTALL DOOR****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.



**Figure 1. Door — Locations.**

### NOTE

Four doors (Figure 1) are installed on the AMMPS 30kW generator set. Each door may be removed with its corresponding body panel or frame during installation or removal from generator set.

Each door has two hinges. Hinge removal, inspection, and installation procedures are the same for each door.

Large doors are secured using two latches. Small doors are secured using a single latch. All doors have a door stay with locking link to hold the door in the open position. Door stay brackets are mounted behind the top door hinge and on the door panel.

Removal and installation procedures are the same for all hinges and door stays.

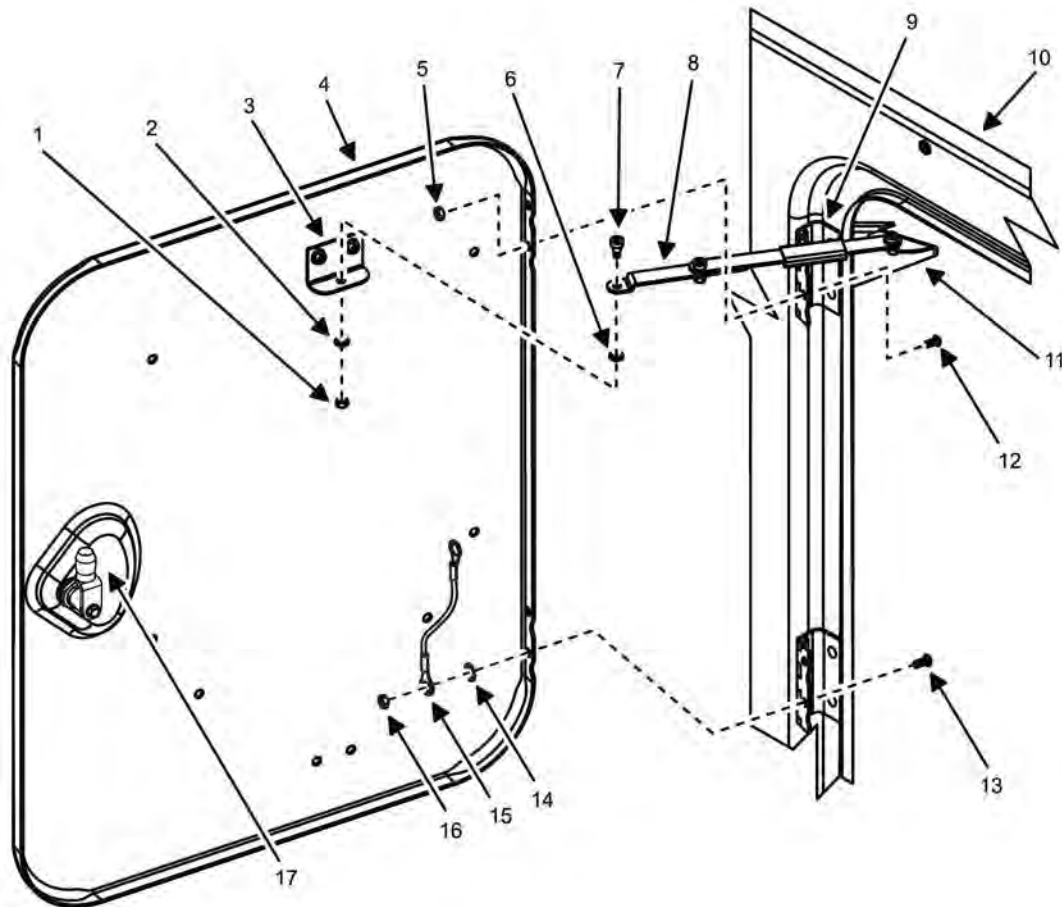
## Remove Door

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open and support door (Figure 2, Item 4) to be removed.
3. Remove nut (Figure 2, Item 1) and two washers (Figure 2, Items 2 and 6) from hex shoulder bolt (Figure 2, Item 7) securing door stay (Figure 2, Item 8) to door stay bracket (Figure 2, Item 3).

### NOTE

One set of hardware attaching hinge (Figure 2, Item 9) to door also secures ground wire (Figure 2, Item 15).

4. Remove nut (Figure 2, Item 16), ground wire (Figure 2, Item 15), lock washer (Figure 2, Item 14), and screw (Figure 2, Item 13) from bottom hinge of door (Figure 2, Item 4). Discard lock washer (Figure 2, Item 14).
5. Remove remaining three screws (Figure 2, Item 12) and nuts (Figure 2, Item 5) securing door (Figure 2, Item 4) to two hinges (Figure 2, Item 9) on unit body panel (Figure 2, Item 10).



**Figure 2. Door — Removal/Installation.**

6. Remove door (Figure 2, Item 4) and place on a suitable work surface.

**END OF TASK**

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**Inspect Door**

1. Inspect door (Figure 2, Item 4) for excessive corrosion or damage, and repair (WP 0036, Repair Door) or replace as required.
2. Inspect hinge(s) (Figure 2, Item 9) for freedom of movement and for excessive corrosion or damage, and repair or replace (WP 0036, Repair Door) as required.
3. Inspect screws (Figure 2, Item 12), washers (Figure 2, Items 2 and 6), and nut (Figure 2, Item 1), for excessive corrosion or damage, and replace as required.
4. Inspect door stay (Figure 2, Item 8), door stay bracket (Figure 2, Item 3), and body panel stay bracket (Figure 2, Item 11) for excessive corrosion or damage, and repair or replace as required. See Remove Door Stay and Brackets task and Install Door Stay and Brackets task.
5. Inspect door latch (Figure 2, Item 17) for excessive corrosion or damage and repair or replace (WP 0036, Repair Door) as required.
6. Remove door stay bracket (Figure 2, Item 3) from door (Figure 2, Item 4) if door (Figure 2, Item 4) is being replaced. See Remove Door Stay and Brackets task.
7. Remove body panel stay bracket (Figure 2, Item 11) from unit body panel (Figure 2, Item 10) if unit body panel (Figure 2, Item 10) or body panel stay bracket (Figure 2, Item 11) are being replaced. See Remove Door Stay and Brackets task.

**END OF TASK****Install Door**

1. Position door (Figure 2, Item 4) to hinges (Figure 2, Item 9) and align mounting holes.

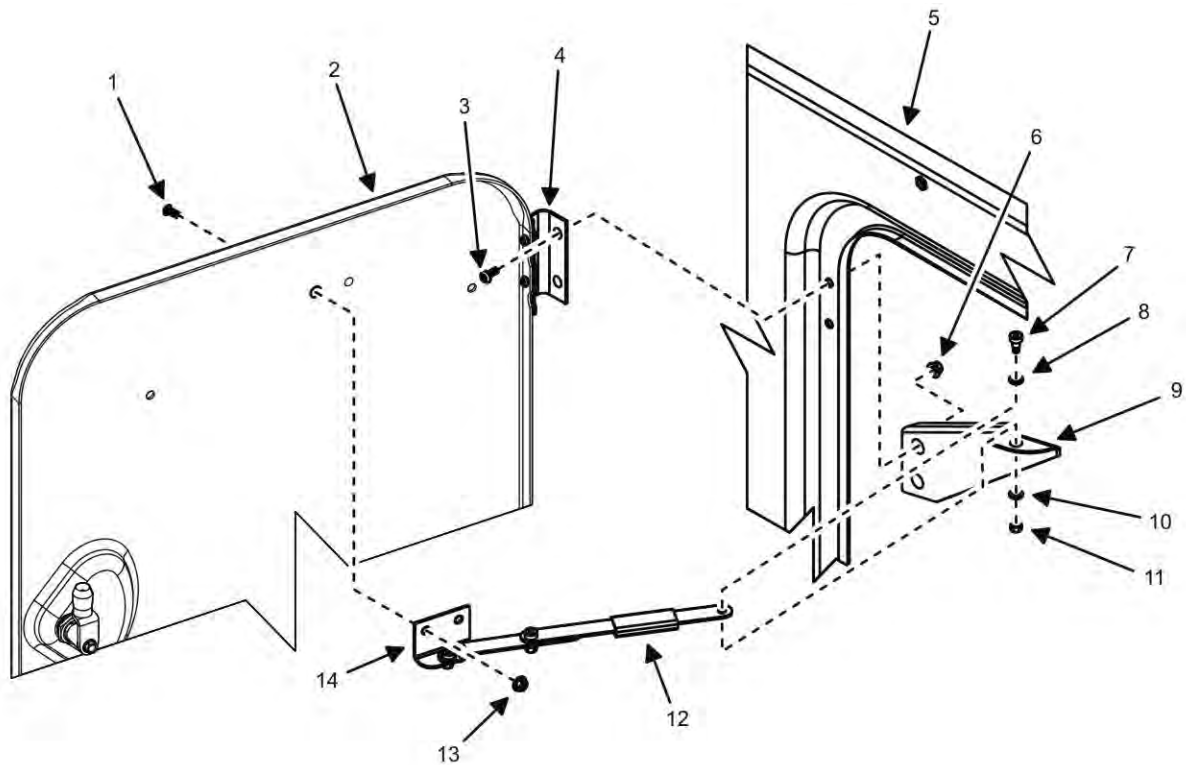
**NOTE**

One set of hardware attaching hinge (Figure 2, Item 9) to door also secures ground wire (Figure 2, Item 15).

2. Install ground wire (Figure 2, Item 15) to bottom hinge of door (Figure 2, Item 4) with nut (Figure 2, Item 16), new lock washer (Figure 2, Item 14), and screw (Figure 2, Item 13).
3. Install remaining three screws (Figure 2, Item 12) and nuts (Figure 2, Item 5) to secure door (Figure 2, Item 4) to two hinges (Figure 2, Item 9) on unit body panel (Figure 2, Item 10).
4. Install hex shoulder bolt (Figure 2, Item 7) and two washers (Figure 2, Items 2 and 6) through door stay (Figure 2, Item 8) and door stay bracket (Figure 2, Item 3), and secure with washer (Figure 2, Item 2) and nut (Figure 2, Item 1).
5. Torque nuts (Figure 2, Items 16, 5, and 1) to 88 – 106 in/lbs (10 – 12 Nm),
6. Verify proper operation of door (Figure 2, Item 4), hinges (Figure 2, Item 9), door latch (Figure 2, Item 17), and door stay (Figure 2, Item 8).
7. Repair as required.

**END OF TASK**

## Remove Door Stay and Brackets



**Figure 3. Door Stay, Bracket, and Hinge — Detail.**

1. Remove hex head shoulder bolt (Figure 3, Item 7), two washers (Figure 3, Items 8 and 10), and nut (Figure 3, Item 11) and remove door stay (Figure 3, Item 12) from body panel stay bracket (Figure 3, Item 9).
2. Remove two hex socket head screws (Figure 3, Item 3) and two nuts (Figure 3, Item 6) to separate hinge (Figure 3, Item 4) and body panel stay bracket (Figure 3, Item 9) from unit body panel (Figure 3, Item 5).
3. Remove remaining hinge (not shown) by removing two hex socket head screws (Figure 3, Item 3) and two nuts (Figure 3, Item 6), and separate hinge (not shown) from unit body panel (Figure 3, Item 5).
4. Remove two hex socket head screws (Figure 3, Item 1) and nuts (Figure 3, Item 13) securing door stay bracket (Figure 3, Item 14) to inside of door (Figure 3, Item 2).
5. Place hinge(s) (Figure 3, Item 4), door stay (Figure 3, Item 12), door stay bracket (Figure 3, Item 14), body panel stay bracket (Figure 3, Item 9), hex socket head screws (Figure 3, Items 1 and 3), and nuts (Figure 3, Items 6 and 13) on a suitable work surface.

## END OF TASK

### Inspect Door Stay and Brackets

1. Inspect door stay (Figure 3, Item 12), door stay bracket (Figure 3, Item 14), body panel stay bracket (Figure 3, Item 9), for damage or corrosion. Repair or replace as required.
2. Inspect hinge (Figure 3, Item 4), hex socket head screws (Figure 3, Item 1 and Item 3), and nuts (Figure 3, Item 6 and Item 13) for freedom of movement, damage, or corrosion. Repair or replace as required (WP 0036, Repair Door).

3. Repair or replace damaged, broken, or excessively corroded mounting hardware.

## END OF TASK

### Install Door Stay and Brackets

#### NOTE

Two types of body panel stay brackets (Figure 3, Item 9) are available. Be sure to use the correct bracket for the door being serviced.

1. Position body panel stay bracket (Figure 3, Item 9) and hinge (Figure 3, Item 4) onto unit body panel (Figure 3, Item 5) and align mounting holes.
2. Install hex socket head screws (Figure 3, Item 3) and nuts (Figure 3, Item 6) securing body panel stay bracket (Figure 3, Item 9) and hinge (Figure 3, Item 4) to unit body panel (Figure 3, Item 5).
3. Install remaining hinge (not shown) by installing two hex socket head screws (Figure 3, Item 3) and two nuts (Figure 3, Item 6) to unit body panel (Figure 3, Item 5).
4. Position door stay bracket (Figure 3, Item 14) onto door (Figure 3, Item 2) and align mounting holes. Ensure proper orientation of door stay bracket (Figure 3, Item 14).
5. Install hex socket head screws (Figure 3, Item 1) through door (Figure 3, Item 2) and door stay bracket (Figure 3, Item 14), and secure with two nuts (Figure 3, Item 13).
6. Install hex head shoulder bolt (Figure 3, Item 7), two washers (Figure 3, Items 8 and 10), and nut (Figure 3, Item 11) to secure door stay (Figure 3, Item 12) to body panel stay bracket (Figure 3, Item 9).
7. Torque nuts (Figure 2, Items 16, 5, and 1) to 88 – 106 in/lbs (10 – 12 Nm),
8. Verify proper operation of door (Figure 3, Item 2), hinge(s) (Figure 3, Item 4), and door stay (Figure 3, Item 12) by opening and closing door (Figure 3, Item 2) and using door stay (Figure 3, Item 12) to hold door (Figure 3, Item 2) in open position.
9. Repair as required.
10. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
11. Close all unit doors.

## END OF TASK

## END OF WORK PACKAGE



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REPAIR DOOR**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Hinge (WP 0109, Repair Parts List, Figure 4, Item 31)

Latch (WP 0109, Figure 4, Item 34)

Grease, electrically conductive (WP 0180, Expendable and Durable Items List, Item 22)

**Personnel Required**

91D (1)

**References**

WP 0035, Remove/Install Door

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

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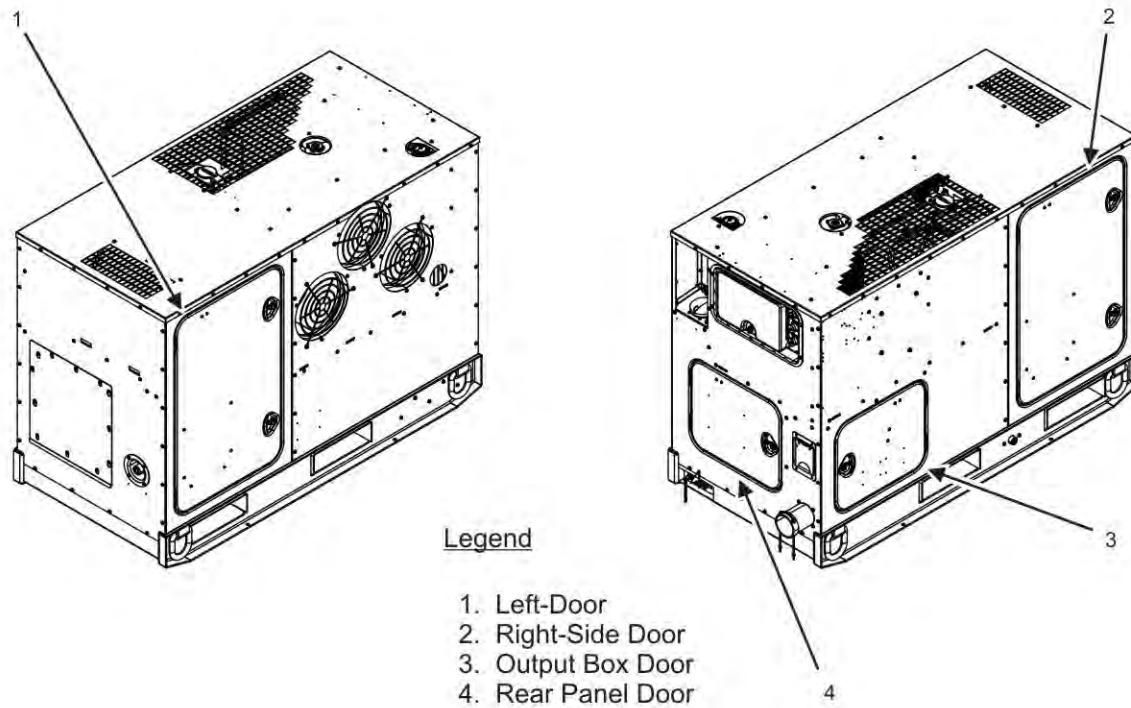
**REPAIR DOOR****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

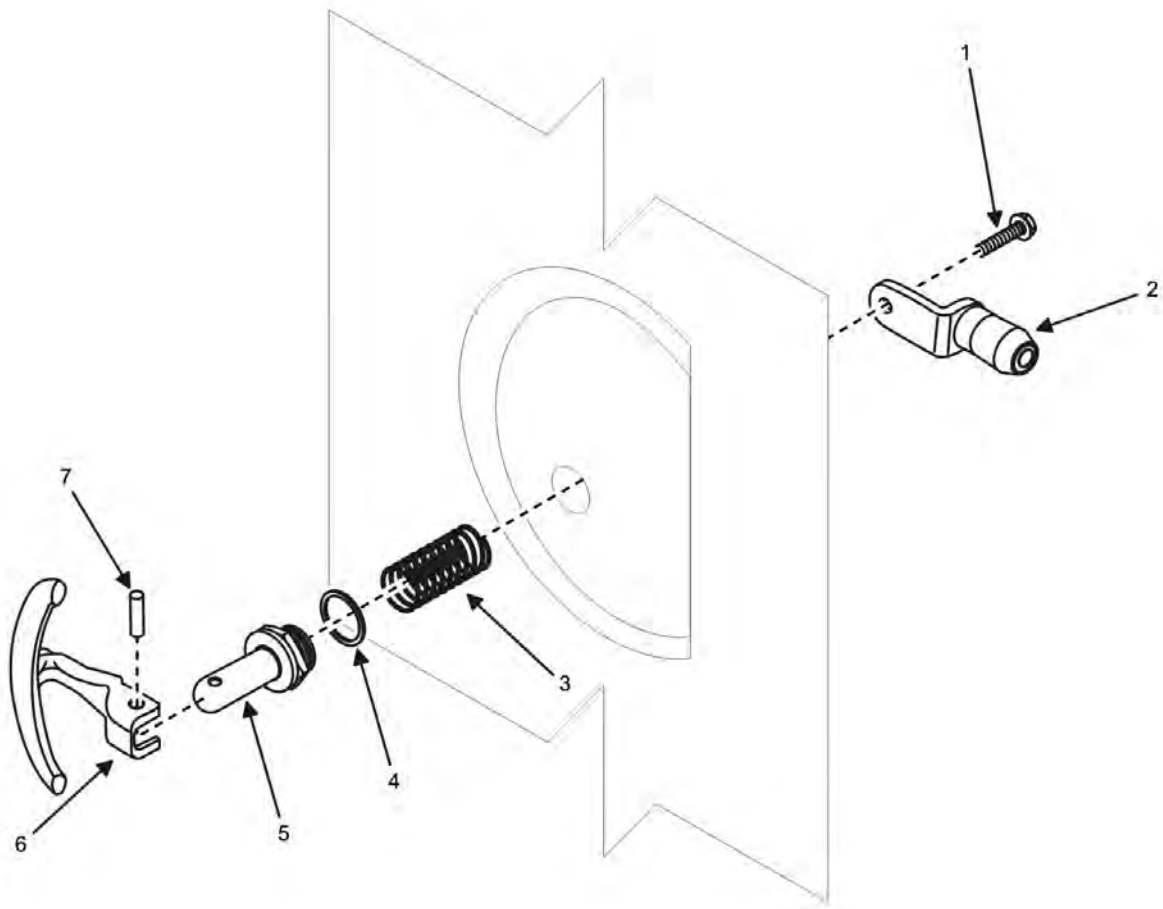
**NOTE**

Four doors (Figure 1) are installed on the generator set. Repair of doors is accomplished by replacement of door, door latch, door stay assembly, and/or hinges. Door latches and hinges can be replaced with panel installed on the unit or with panel removed.

Replacement procedures for the door, door latch, door stay assembly, and hinges are the same for all doors. Procedures are also the same whether door panel is installed or removed from unit.

**Remove Latch****Figure 1. Door Repair — Locations.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate door to be repaired (Figure 1).



**Figure 2. Door Latch Components.**

**NOTE**

Separating the inner latch and outer latch components releases a spring inside the outer latch. Ensure that this spring is not lost during removal.

3. Remove bolt (Figure 2, Item 1) securing inner door latch (Figure 2, Item 2) to outer latch pivot mounting (Figure 2, Item 5) and place on a suitable work surface.
4. Disconnect inner door latch (Figure 2, Item 2) and outer latch pivot mounting (Figure 2, Item 5) and remove inner door latch (Figure 2, Item 2), spring (Figure 2, Item 3), washer (Figure 2, Item 4), and outer latch pivot mounting (Figure 2, Item 5) from door. Place all latch parts on a suitable work surface.
5. Remove roll pin (Figure 2, Item 7) securing T-handle (Figure 2, Item 6) to outer latch pivot mounting (Figure 2, Item 5) and place roll pin (Figure 2, Item 7) on a suitable work surface.
6. Remove T-handle (Figure 2, Item 6) from outer latch pivot mounting (Figure 2, Item 5) and place on a suitable work surface.
7. Inspect all door latch parts for corrosion or other damage, and replace as required.

**END OF TASK**

## Install Latch

### NOTE

If T-handle (Figure 2, Item 6) has been removed from outer latch pivot mounting (Figure 2, Item 5), complete steps 1 through 3 to reassemble outer door latch parts. If T-handle (Figure 2, Item 6) has not been removed, proceed to step 4.

1. Position T-handle (Figure 2, Item 6) to outer latch pivot mounting (Figure 2, Item 5) and align mounting holes.
2. Install roll pin (Figure 2, Item 7) through mounting holes to secure T-handle (Figure 2, Item 6) to outer latch pivot mounting (Figure 2, Item 5).
3. Install washer (Figure 2, Item 4) and spring (Figure 2, Item 3) inside outer latch pivot mounting (Figure 2, Item 5).
4. Position inner door latch (Figure 2, Item 2) and outer latch pivot mounting (Figure 2, Item 5) with T-handle (Figure 2, Item 6) to their mounting locations on either side of door.
5. Secure inner door latch (Figure 2, Item 2) and outer latch pivot mounting (Figure 2, Item 5) to door by installing bolt (Figure 2, Item 1).
6. Check door latch for proper operation.
7. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).

## END OF TASK

## Remove Hinge

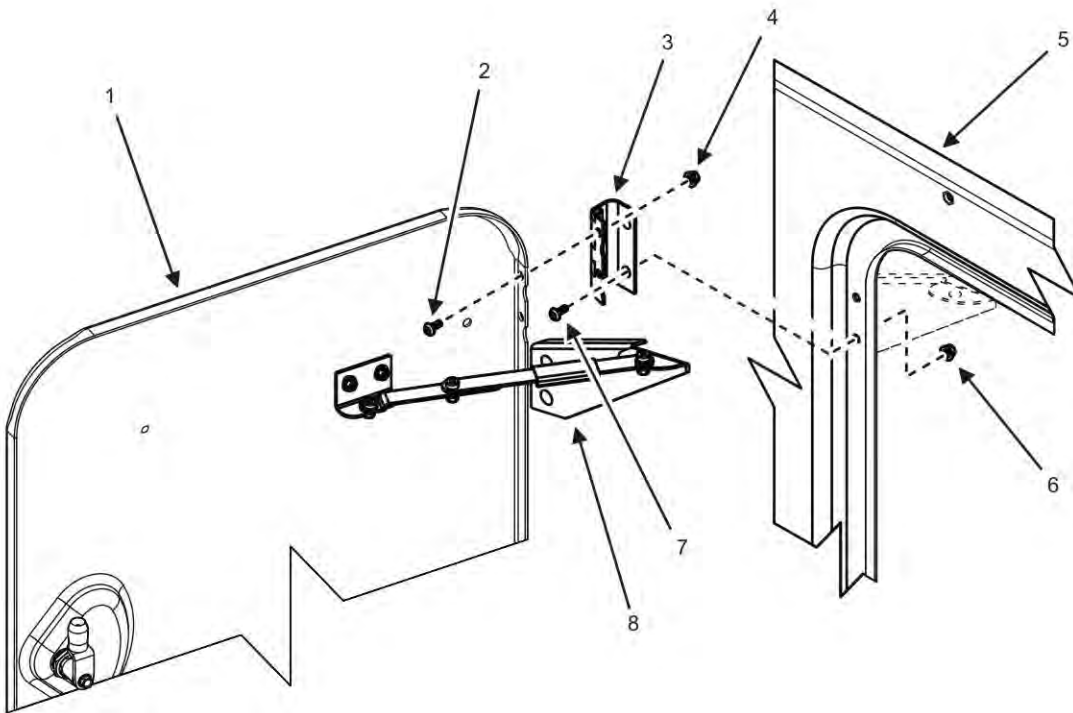


Figure 3. Door Hinge Components.

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## NOTE

Doors are attached to mounting locations by two hinges. One hinge can be replaced without removing the door from the unit. Remove and install procedures are the same for all hinges unless removing or installing doors with door stay brackets.

For hinges with door stay brackets attached, release bracket from hinge mounting location but leave opposite end of door stay fastened to door.

1. Open door (Figure 3, Item 1) with hinge(s) (Figure 3, Item 3) to be removed.
2. Remove screws (Figure 3, Item 2) and nuts (Figure 3, Item 4) securing hinge (Figure 3, Item 3) to door (Figure 3, Item 1).
3. Remove screws (Figure 3, Item 7) and nuts (Figure 3, Item 6) securing hinge (Figure 3, Item 3), and door stay bracket (Figure 3, Item 8) as required to body panel (Figure 3, Item 5).
4. Remove hinge (Figure 3, Item 3) and door (Figure 3, Item 1) from unit and place on a suitable work surface.
5. Inspect all door and hinge parts for corrosion or other damage. Replace as required.

## END OF TASK

### Install Hinge

1. Position hinge (Figure 3, Item 3) to its mounting location on door (Figure 3, Item 1) and align mounting holes.
2. Install hinge (Figure 3, Item 3) to door (Figure 3, Item 1) using screws (Figure 3, Item 2) and nuts (Figure 3, Item 4). Finger-tighten.
3. Position door stay bracket (Figure 3, Item 8), as required, by aligning bracket mounting holes with mounting holes in hinge (Figure 3, Item 3) and in body panel (Figure 3, Item 5).
4. Install hinge (Figure 3, Item 3) and door stay bracket (Figure 3, Item 8) to body panel (Figure 3, Item 5) using screws (Figure 3, Item 7) and nuts (Figure 3, Item 6). Finger-tighten.
5. Secure all hinge screws (Figure 3, Item 2 and Item 7) to a torque value of 86.74 – 105.3 in/lb (9.8 – 11.9 Nm).
6. Verify proper hinge (Figure 3, Item 3) operation by opening and closing door, and repair as needed.
7. Verify proper door stay (Figure 3, Item 8) operation, and repair or replace as needed (WP 0035, Remove/Install Door).
8. Repeat Replace Door Hinge task as needed for other hinges.
9. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
10. Close all generator set doors.

## END OF TASK

## END OF WORK PACKAGE



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL BATTERIES**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Battery, storage (2) (WP 0107, Repair Parts List, Figure 2, Item 8)

Brush, battery terminal (WP 0180, Expendable and Durable Items List, Item 6)

Grease, electrically conductive (WP 0180, Item 22)

Rags, wiping (WP 0180, Item 33)

**Personnel Required**

91D (1)

Assistant (1)

**References**

Not Applicable

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

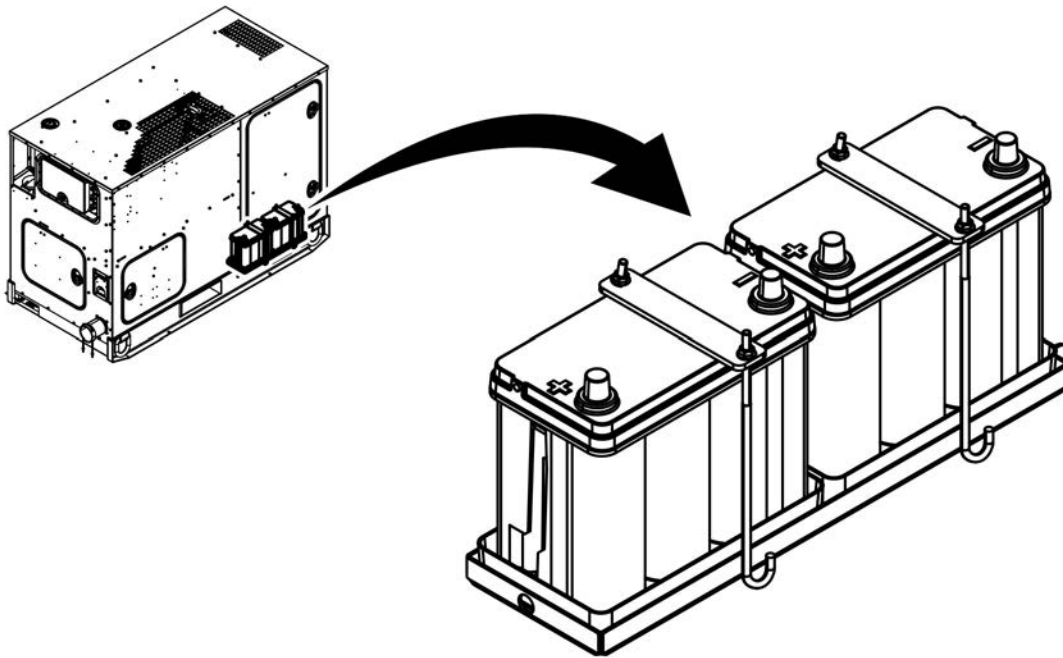
Engine cool

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**REMOVE/INSTALL BATTERIES****WARNING**

Do not damage batteries. Storage batteries are filled with a liquid acid that can leak from sealed battery when case is broken. Contact with acidic liquid can burn skin and eyes. Wear safety goggles and chemical gloves and avoid acid splash while handling damaged batteries. Do not move batteries by terminals. Failure to comply may cause injury or death to personnel or damage to equipment.

## Remove Batteries



**Figure 1. Battery — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door of generator set to locate batteries (Figure 1).





## WARNING

The right-hand battery negative lead that connects directly to the grounding stud must be disconnected prior to disconnecting or removing batteries. Follow procedural steps in exact order given for removal and installation. Failure to comply may cause injury or death to personnel.

3. Disconnect battery unit ground cable (Figure 2, Item 3) from negative battery terminal (Figure 2, Item 4) of right-hand battery (Figure 2, Item 7).
4. Disconnect battery jumper cable (Figure 2, Item 6) from negative battery terminal (Figure 2, Item 9) of left-hand battery (Figure 2, Item 8).

## NOTE

Sealed lead acid batteries do not leak in normal usage. The battery can be moved out of the tray and tilted to allow movement of left-hand battery (Figure 2, Item 8) for ease of terminal removal.

5. Disconnect battery unit power cable (Figure 2, Item 12) from positive battery terminal (Figure 2, Item 11) of left-hand battery (Figure 2, Item 8).
6. Disconnect battery jumper cable (Figure 2, Item 6) from positive battery terminal (Figure 2, Item 5) of right-hand battery (Figure 2, Item 7).
7. Remove jumper cable (Figure 2, Item 6) from unit.
8. Inspect jumper cable (Figure 2, Item 6) for frayed edges, cracks in insulation, and other obvious signs of damage. Replace as required.
9. Loosen and remove four nuts (Figure 2, Item 1) from four J-hooks (Figure 2, Item 13) securing two battery holders (Figure 2, Item 2) to unit.
10. Inspect nuts (Figure 2, Item 1) for corrosion, excessive wear, and other signs of obvious damage. Replace as required.
11. Remove two battery holders (Figure 2, Item 2) from unit.
12. Inspect battery holders (Figure 2, Item 2) for corrosion, excessive wear, and other signs of obvious damage. Replace as required.

## CAUTION

Do not move or lift batteries by the terminal studs. Lift batteries using battery lifting strap if supplied with battery. Failure to comply will cause damage to equipment.

13. Lift and remove two batteries (Figure 2, Items 7 and 8) from unit.
14. Lift and remove two removable battery trays (Figure 2, Item 10) from unit.

## WARNING

Eye protection is required when working with compressed air. Do not use compressed air to clean skin. Do not aim at personnel. Compressed air can propel particles at high velocity and injure eyes. Failure to comply may cause injury or death to personnel.

15. Clean dirt and debris from removable battery trays (Figure 2, Item 10) with compressed air and wiping rag.
16. Inspect removable battery trays (Figure 2, Item 10) for corrosion, dents, and other signs of obvious damage. Replace as required.
17. Remove four J-hooks (Figure 2, Item 13) from unit.

18. Inspect J-hooks (Figure 2, Item 13) for corrosion, excessive wear, and other signs of obvious damage. Replace as required.
19. Clean dirt and debris from battery compartment with wiping rag.

## END OF TASK

### Test/Inspect Batteries

1. Inspect batteries (Figure 2, Items 7 and 8) for leaks, cracks, swelling, and corrosion. Replace batteries (Figure 2, Items 7 and 8) as required.
2. Inspect battery terminals (Figure 2, Items 4, 5, 9 and 11) for melting, bends, or other damage. Replace batteries (Figure 2, Items 7 and 8) as required.
3. Ensure equipment conditions are met in order presented in initial setup.
4. Remove dirt and debris from all battery terminals (Figure 2, Items 4, 5, 9, and 11) with battery terminal cleaner.

### NOTE

The DCS provides a constant real-time monitor of battery voltage and current.

5. Test voltage of each battery (Figure 2, Items 7 and 8) with multimeter.

### WARNING

Batteries give off combustible gas. Do not smoke or use open flame when performing maintenance. Failure to comply may cause injury or death to personnel and damage to equipment.

### CAUTION

When recharging batteries (Figure 2, Items 7 and 8 ), always use a voltage regulated battery charger, and strictly adhere to all limits in Table 1. When first turning on a charger, always watch the ammeter for the first few minutes to verify that each battery (Figure 2, Items 7 and 8) is accepting amperage. Batteries (Figure 2, Items 7 and 8) will get slightly warm during charging. Any battery (Figure 2, Items 7 and 8) that is hot to the touch indicates a malfunction and charging must be stopped immediately. Failure to comply will cause damage to equipment.

### NOTE

A completely discharged battery is considered to have 11.2 VDC or less. A deeply discharged battery (10.5 VDC or less) may not accept a charge from a charger. A deeply discharged battery may need to be charged while in parallel with another fully charged 12 VDC automotive battery until deeply discharged battery reaches 10.5 VDC or above. Once deeply discharged battery reaches 10.5 VDC, normal charging procedures can be followed.

6. Charge any battery (Figure 2, Items 7 and 8) with voltage reading less than 12 VDC (Table 1).

**Table 1. Charging Recommendations.**

CHARGER TYPE	TARGET VOLTAGE RANGE (VDC)	MAXIMUM CURRENT (AMPS)
Regular/Automatic	13.8 to 15.0	10
Float Charge	13.2 to 13.8	1
Constant Voltage Charger	15.6 maximum	No limit as long as battery temperature remains below 125°F (51.7°C)

**NOTE**

After charging, allow each charged battery (Figure 2, Items 7 and 8) to settle ("rest") for a minimum of 8 hours. Batteries (Figure 2, Items 7 and 8) should have approximately 12.80 VDC open circuit voltage after charging and settle period.

7. Use a multimeter and check each settled ("rested") battery (Figure 2, Items 7 and 8) for proper voltage.
8. Use battery (Figure 2, Items 7 and 8) if within specification, or attempt recharge, and replace battery (Figure 2, Items 7 and 8) if discharge continues after one additional charging attempt.
9. Ensure batteries are connected (Install Batteries task).

**NOTE**

Use of an assistant is required to load test batteries. Batteries should hold proper voltage during a load test of 15 sec.

10. Use a multimeter set to test VDC to measure the voltage of each battery while an assistant positions DEAD CRANK SWITCH in CRANK position for 15 sec (TM 9-6115-752-10).
11. Follow charge procedures (steps 6 through 8) for any battery (Figure 2, Items 7 and 8) that drops below 10 VDC during load test.

**END OF TASK****Install Batteries**

1. Insert four J-hooks (Figure 2, Item 13) through openings in battery compartment permanent tray (not shown) beneath removable battery trays (Figure 2, Item 10).

**NOTE**

Place battery (Figure 2, Items 7 and 8) and removable battery tray (Figure 2, Item 10) in center of permanent tray for ease of installation. Battery and removable battery tray (Figure 2, Item 10) may be placed in position after attaching unit power cable.

2. Place two battery trays (Figure 2, Item 10) into mounting position in unit.

**CAUTION**

Do not move or lift batteries by the terminal studs. Lift batteries using battery lifting strap if supplied with battery. Failure to comply will cause damage to equipment.

3. Position left-hand battery (Figure 2, Item 8) in removable battery tray (Figure 2, Item 10) with positive terminal facing to the left.
4. Position battery holder (Figure 2, Item 2) across top-center of battery and align holes with two J-hooks (Figure 2, Item 13).

5. Install one nut (Figure 2, Item 1) to each J-hook (Figure 2, Item 13) and hand-tighten both nuts (Figure 2, Item 1).
6. Install right-hand battery (Figure 2, Item 7) using steps 3 through 5.

### NOTE

Clean all battery terminals using a battery terminal cleaner.

7. Apply a light coating of electrically conductive grease to all battery terminals (Figure 2, Items 4, 5, 9, and 11).
8. Attach battery unit power cable (Figure 2, Item 12) to positive terminal (Figure 2, Item 11) of left-hand battery (Figure 2, Item 8).
9. Attach battery jumper cable (Figure 2, Item 6) to positive battery terminal (Figure 2, Item 5) of right-hand battery (Figure 2, Item 7).
10. Attach battery jumper cable (Figure 2, Item 6) to negative battery terminal (Figure 2, Item 9) of left-hand battery (Figure 2, Item 8).
11. Adjust position of two battery holders (Figure 2, Item 2) to secure batteries (Figure 2, Items 7 and 8) in position.

### CAUTION

Excessive tightening of the battery holder (Figure 2, Item 2) may crack the battery case. Do not over-tighten nuts (Figure 2, Item 1) on J-hooks (Figure 2, Item 12). Failure to comply may cause damage to equipment.

12. Tighten four nuts (Figure 2, Item 1) to secure batteries.
13. Attach battery unit ground cable (Figure 2, Item 3) to negative battery terminal (Figure 2, Item 4) of right-hand battery (Figure 2, Item 7).
14. Close generator set doors.

### CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

15. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
16. Start engine and check for proper operation (TM 9-6115-752-10).
17. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL RELAY PANEL**

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**INITIAL SETUP:**

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)  
 Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Circuit breaker (5) (WP 108, Repair Parts List, Figure 3, Item 3)  
 Circuit breaker (1) (WP 108, Figure 3, Item 4)  
 Circuit breaker (2) (WP 108, Figure 3, Item 5)  
 Panel, relay (WP 0108, Figure 3, Item 1)  
 Relay (8) (WP 108, Figure 8, Item 2)  
 Cleaning compound, solvent (WP 0180, Expendable and Durable Items List, Item 11)  
 Grease, electrically conductive (WP 0180, Item 22)  
 Rags, wiping (WP 0180, Item 33)

**Personnel Required**

91D (1)

**References**

WP 0100, General Maintenance  
 Foldout Pages

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)  
 Engine cool  
 Battery ground cable removed (WP 0037, Remove/Install Batteries)  
 Top body panel removed (WP 0029, Remove/Install Top Body Panel)  
 Left-side body panel removed (WP 0032, Remove/Install Left-Side Body Panels)  
 DCS removed (WP 0017, Remove/Install DCS)

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**REMOVE/INSTALL RELAY PANEL**

**Remove Relay Panel**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open rear access door and locate relay panel (Figure 1) on brackets above fuel tank.

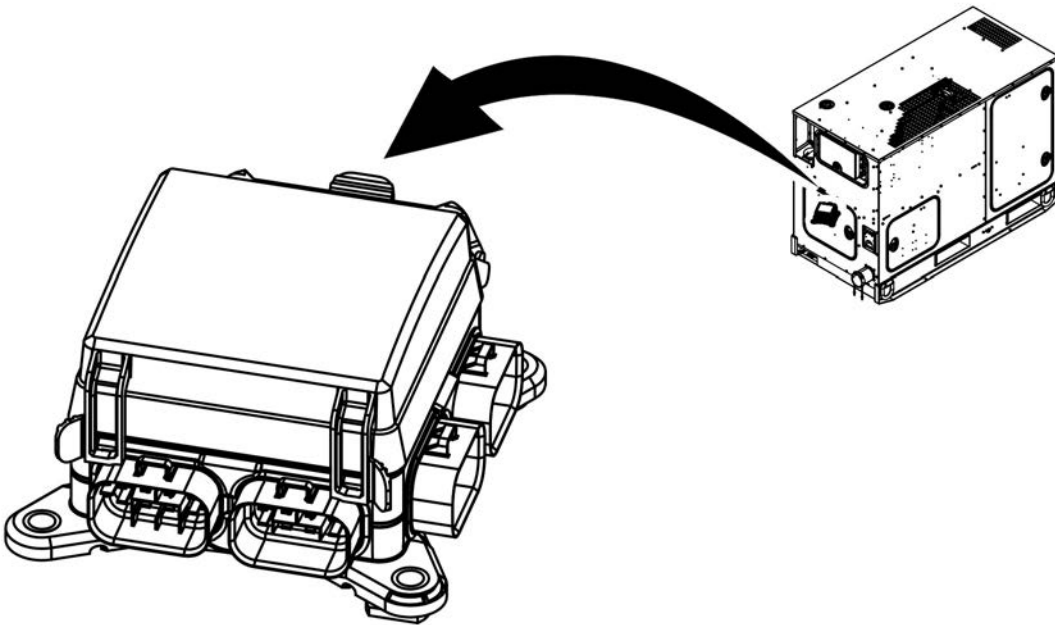


Figure 1. Relay Panel — Location.

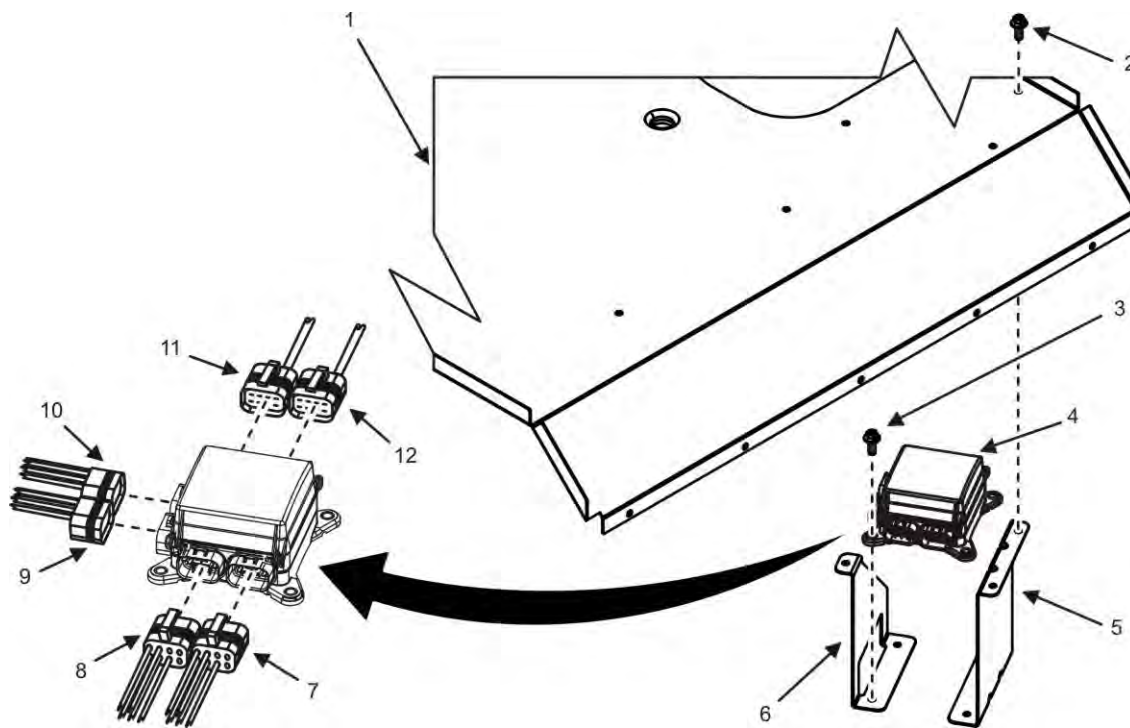


Figure 2. Relay Panel — Removal.



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**NOTE**

The six electrical connectors (Figure 2, Items 7 through 12) attached to the relay panel (Figure 2, Item 4) are all uniquely keyed and color coded. Each connector will fit into only one of the outlets on the relay panel.

3. Tag and remove six electrical connectors (Figure 2, Items 7 through 12) from relay panel (Figure 2, Item 4).
4. Remove four flare head screws (Figure 2, Item 3) securing relay panel (Figure 2, Item 4) to brackets (Figure 2, Items 5 and 6).
5. Remove relay panel (Figure 2, Item 4) from generator set and place on a suitable work surface.
6. Remove three screws (Figure 2, Item 2) securing relay panel brackets (Figure 2, Items 5 and 6) to bottom of radiator support panel (Figure 2, Item 1).
7. Remove relay panel brackets (Figure 2, Items 5 and 6) from generator set and place on a suitable work surface.

**END OF TASK****Inspect Relay Panel**

1. Inspect all relay panel electrical connectors (Figure 2, Items 7 through 12) and wiring harness for signs of damage. Repair or replace damaged electrical connectors (WP 0100, General Maintenance) as required.
2. Inspect relay panel (Figure 2, Item 4) for signs of damage and replace as required.
3. Inspect brackets (Figure 2, Items 5 and 6) for signs of damage and replace as required.

**END OF TASK****Install Relay Panel**

1. Install relay panel mounting brackets (Figure 2, Items 5 and 6) to underside of radiator support panel (Figure 2, Item 1).
2. Position relay panel (Figure 2, Item 4) to its mounting position on mounting brackets (Figure 2, Items 5 and 6) and secure by installing four flare head screws (Figure 2, Item 3) to corner mounting holes.

**NOTE**

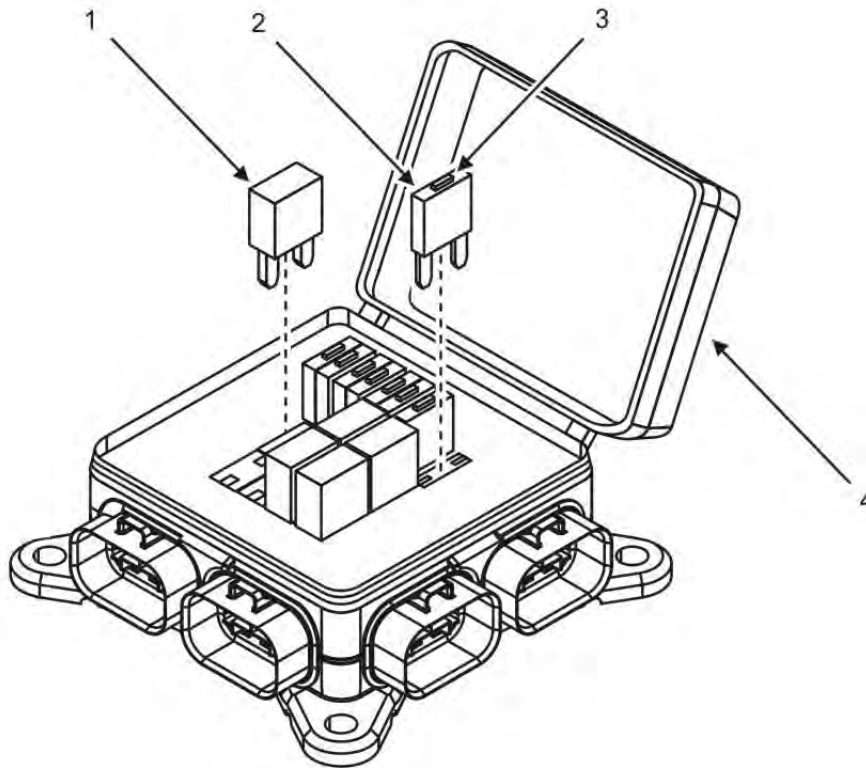
Leave all identification tags/markings in place until task is completed and generator set is fully operational.

3. Install six electrical connectors (Figure 2, Items 7 through 12) to relay panel using tags/markings applied at removal as a guide.
4. Close rear access door.
5. Install left-side body panel (WP 0032, Remove/Install Left-Side Body Panel).
6. Install DCS (WP 0018, Remove/Install DCS).
7. Install top body panel (WP 0029, Remove/Install Top Body Panel).
8. Install negative ground cable to right-hand battery (WP 0039, Remove/Install Batteries).
9. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).

10. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
11. Repair as required.

## END OF TASK

### Service Relay Panel



**Figure 3. Relay Panel — Internal Layout.**

## CAUTION

When removing a circuit breaker (Figure 3, Item 2) or relay (Figure 3, Item 1) from the relay panel (Figure 2, Item 2), be careful not to tilt the circuit breaker or relay far enough to damage the contact pins. Failure to comply may cause damage to equipment.

## NOTE

Service of the relay panel is accomplished by resetting or replacing a circuit breaker (Figure 3, Item 2) or by replacing a relay (Figure 3, Item 1).

The relay panel (Figure 2, Item 2) has the capacity to house eight circuit breakers (Figure 3, Item 2) and eight relays (Figure 3, Item 1). The number of circuit breakers (Figure 3, Item 2) and relays (Figure 3, Item 1) present in the relay panel (Figure 2, Item 2) is determined by the configuration of individual generator sets. A legend on the inside of the relay panel cover (Figure 4) identifies each individual relay and circuit breaker. Foldout Pages provided in the Rear Matter of this manual also identify the circuits protected by each circuit breaker (Figure 3, Item 2) or relay (Figure 3, Item 1).

**NOTE**

An overload or short circuit in an electrical circuit may cause a circuit breaker (Figure 3, Item 2) to trip or fail completely. Circuit breakers (Figure 3, Item 2) may be reset or replaced as required. An overloaded electrical circuit may also cause failure of the relay (Figure 3, Item 1) in that circuit. Failed relays (Figure 3, Item 1) must be replaced.

Basic electrical troubleshooting procedures will enable the technician to trace an electrical circuit to a failed circuit breaker (Figure 3, Item 2) or relay (Figure 3, Item 1).

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open rear door and locate relay panel (Figure 3, Item 4).
3. Open relay panel (Figure 3, Item 4) cover.
4. Reset tripped circuit breaker (Figure 3, Item 2):
  - a. Open relay panel (Figure 3, Item 4) cover.

**NOTE**

A circuit breaker that has been tripped due to a short in the corresponding electrical circuit will be identified by an extended colored plastic indicator (Figure 3, Item 3) on the circuit breaker.

Technicians may only reset a circuit breaker (Figure 3, Item 2) once after it has tripped. If the circuit breaker trips a second time, it must be replaced.

- b. Check circuit breakers (Figure 3, Item 2) for a tripped-condition.
  - c. Press the extended colored plastic indicator (Figure 3, Item 3) to return it to the set position.
    - (1). Continue with generator set operation if circuit breaker (Figure 3, Item 2) remains in the set position.
    - (2). Troubleshoot electrical circuit to determine cause if circuit breaker (Figure 3, Item 2) will not remain in set position. See Foldout Pages.
  - d. Close relay panel (Figure 3, Item 4) cover.
5. Replace a failed circuit breaker (Figure 3, Item 2):
  - a. Open relay panel (Figure 3, Item 4) cover.

**CAUTION**

Removing the circuit breaker by tilting it at more than a slight angle may damage circuit breaker contact pins and/or relay panel socket. Failure to comply may cause damage to equipment.

- b. Pull failed circuit breaker (Figure 3, Item 2) from relay panel (Figure 3, Item 4) by tilting the circuit breaker slightly.

**CAUTION**

Always replace a failed circuit breaker (Figure 3, Item 2) with one of the same value. Replacing a circuit breaker (Figure 3, Item 2) with one of a greater value may result in damage to equipment. Failure to comply may cause damage to equipment.

- c. Insert new circuit breaker (Figure 3, Item 2) into relay panel (Figure 3, Item 4) in the same slot that housed the failed circuit breaker (Figure 3, Item 2).

6. Replace a failed relay (Figure 3, Item 1):
  - a. Pull failed relay (Figure 3, Item 1) from relay panel (Figure 3, Item 4) by tilting the circuit breaker slightly.
  - b. Insert new relay (Figure 3, Item 1) into relay panel (Figure 3, Item 4) in the same slot that housed the failed relay (Figure 3, Item 1).

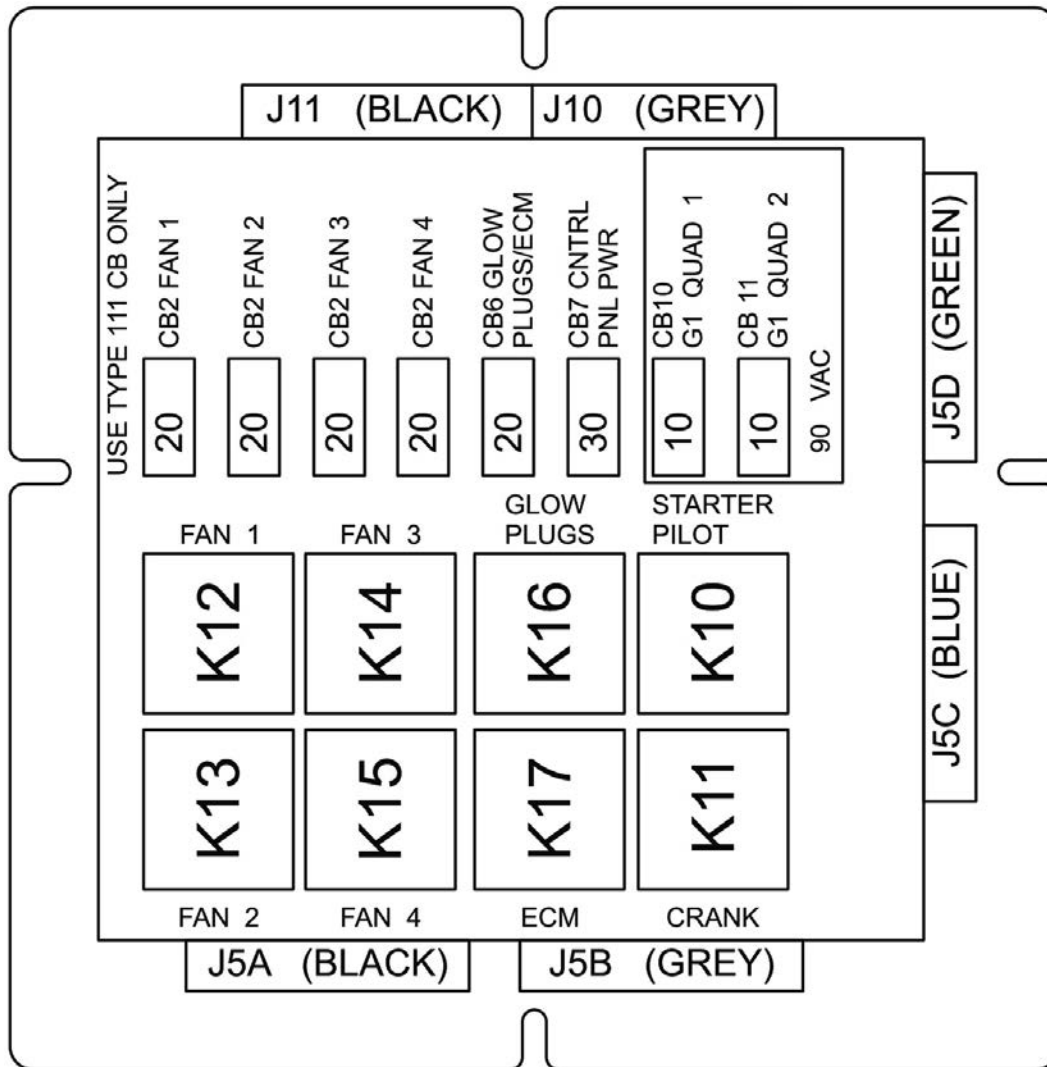
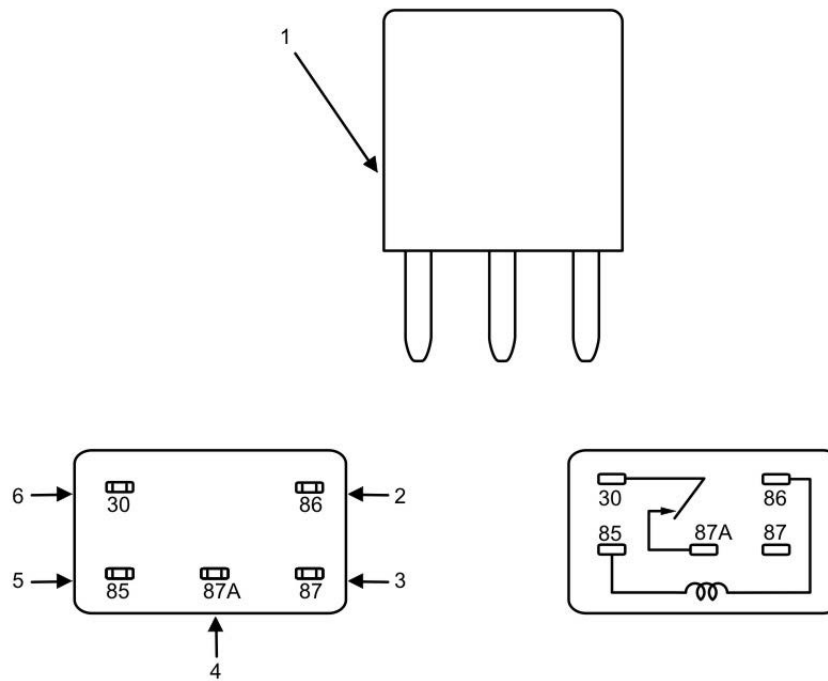


Figure 4. Relay Panel — Legend.



**Figure 5. Test Relay.**

7. Test a relay (Figure 5, Item 1):
  - a. Hold relay (Figure 5, Item 1) close to ear and shake it vigorously. Replace relay (Figure 5, Item 1) if the internals noticeably rattle.
  - b. Test relay (Figure 5, Item 1) for Ohms and continuity:
    - (1). Set multimeter to read either Ohms or continuity.
    - (2). Place multimeter probes on relay pins as shown in Table 1.
    - (3). Compare multimeter reading with values in Table 1.
    - (4). Retain relay (Figure 5, Item 1) for reuse if multimeter reading matches value in “Good” column.
    - (5). Replace relay (Figure 5, Item 1) if multimeter reading matches value in “Bad” column.

**Table 1. Relay Test for Ohms and Continuity.**

Test Across Pins	Ohms — Good	Ohms — Bad	Continuity — Good	Continuity — Bad
85 to 86 (Figure 5, Items 5 to 2)	435 – 531 Ohms	Outside range of 435-531 Ohms	N/A	N/A
30 to 87A (Figure 5, Items 6 to 4)	0 Ohm short circuit	Infinity ( $\infty$ ) Ohms Open circuit	Positive	Negative
30 to 87 (Figure 5, Items 6 to 3)	Infinity ( $\infty$ ) Ohms Open circuit	0 Ohm short circuit	Negative	Positive

**Table 1. Relay Test for Ohms and Continuity — Continued.**

<b>Test Across Pins</b>	<b>Ohms – Good</b>	<b>Ohms - Bad</b>	<b>Continuity - Good</b>	<b>Continuity - Bad</b>
85 to 87, 87A, and 30 (Figure 5, Items 5 to 3, 4, and 6)	Infinity ( $\infty$ ) Ohms Open circuit	0 Ohm short circuit	Negative	Positive
86 to 87, 87A, and 30 (Figure 5, Items 2 to 3, 4, and 6)	Infinity ( $\infty$ ) Ohms Open circuit	0 Ohm short circuit	Negative	Positive

**NOTE**

Voltage required to operate relay is 14.4 to 31.9 VDC applied. Check voltage supply source using a multimeter to verify test voltage is within specification.

- c. Apply 24 VDC across pins 30 and 87 (Figure 5), and listen for an audible “click.”
  - (1). Retain relay (Figure 5, Item 1) for reuse if “click” is heard, indicating connection between pins 30 and 87 (Figure 5) is closed.
  - (2). Replace relay (Figure 5, Item 1) if no “click” is heard, indicating connection between pins 30 and 87 (Figure 5) remains open.
8. Close relay panel (Figure 3, Item 4) cover.
9. Close rear door.
10. Install negative ground cable from right-hand battery (WP 0036, Remove/Install Batteries).
11. Close left-side door.
12. Set engine control switch to PRIME & RUN (TM 9-6115-749-10).
13. Start engine and check for proper operation (TM 9-6115-749-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
14. Repair as required.

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL ENGINE WIRING HARNESS**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0179, Table 2, Item 39)

**Materials/Parts**

Insulation sleeving (WP 0170, Repair Parts List, Figure 65, Item 20)

Washer, lock, external tooth (1) (WP 0170, Figure 65, Item 109)

Wiring harness, engine (WP 0170, Figure 65, Item 1)

Wiring harness, engine (WP 0170, Figure 65, Item 2)

Grease, electrically conductive (WP 0180, Expendable and Durable Items List, Item 22)

Strap, tie-down (WP 0180, Item 36)

Tag, marker (WP 0180, Item 37)

**Personnel Required**

91D (1)

Assistant (1)

**References**

WP 0033, Remove/Install Right-Side Body Panel

WP 0040, Remove/Install Power Wiring Harness

WP 0060, Remove/Install Voltage Selection Board

WP 0100, General Maintenance

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**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Top panel removed (WP 0029, Remove/Install Top Body Panel)

DCS removed (WP 0017, Remove/Install DCS)

Front panel removed (WP 0030, Remove/Install Front Body Panel)

Wires tagged and removed from circuit breaker (UOC 98M only) (WP 0065, Remove/Install Circuit Breaker)

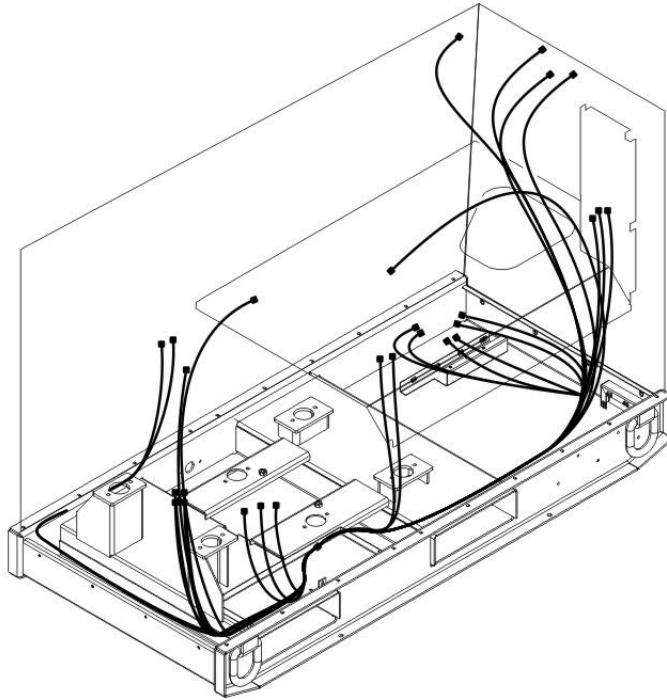
Wire connector P15 tagged and removed from battery-charging alternator (WP 0079, Remove/Install Battery-Charging Alternator)

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**REMOVE/INSTALL ENGINE WIRING HARNESS****NOTE**

Tag/mark all electrical connections prior to removal. Tags/markings applied at removal will aid at installation.

## Remove Engine Wiring Harness



**Figure 1. Engine Wiring Harness — Location.**

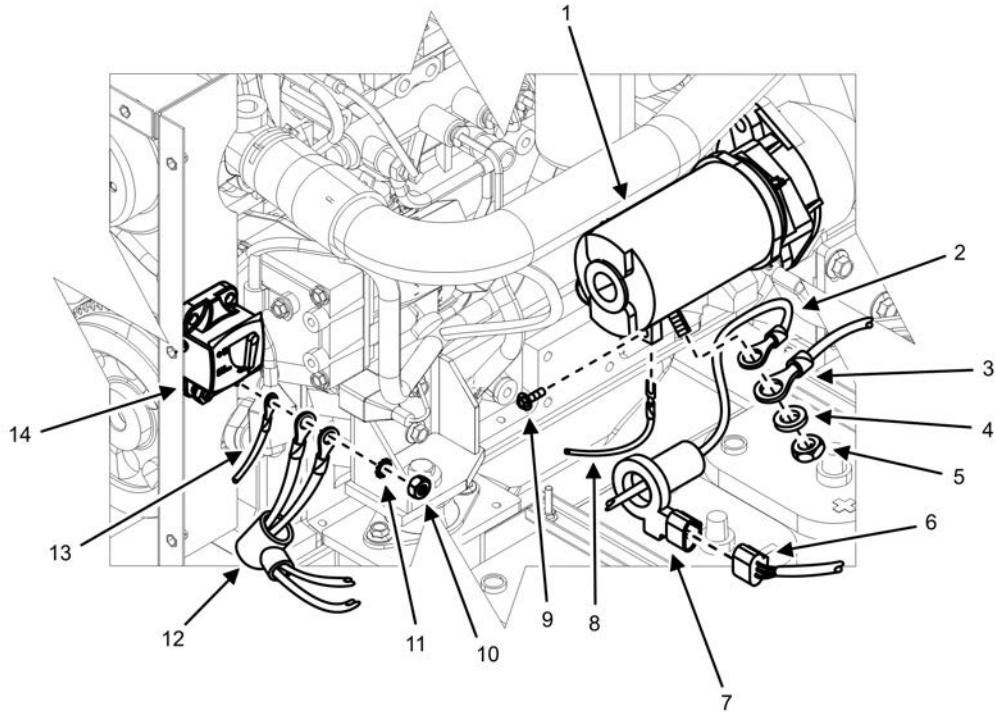
1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate engine wiring harness (Figure 1).

### NOTE

Wiring from the engine wiring harness and power wiring harness connects to the main DC circuit breaker. Ensure only the wiring needed to remove the engine wiring harness is removed. See WP 0040, Remove/Install Power Wiring Harness for location of power wiring harness components.

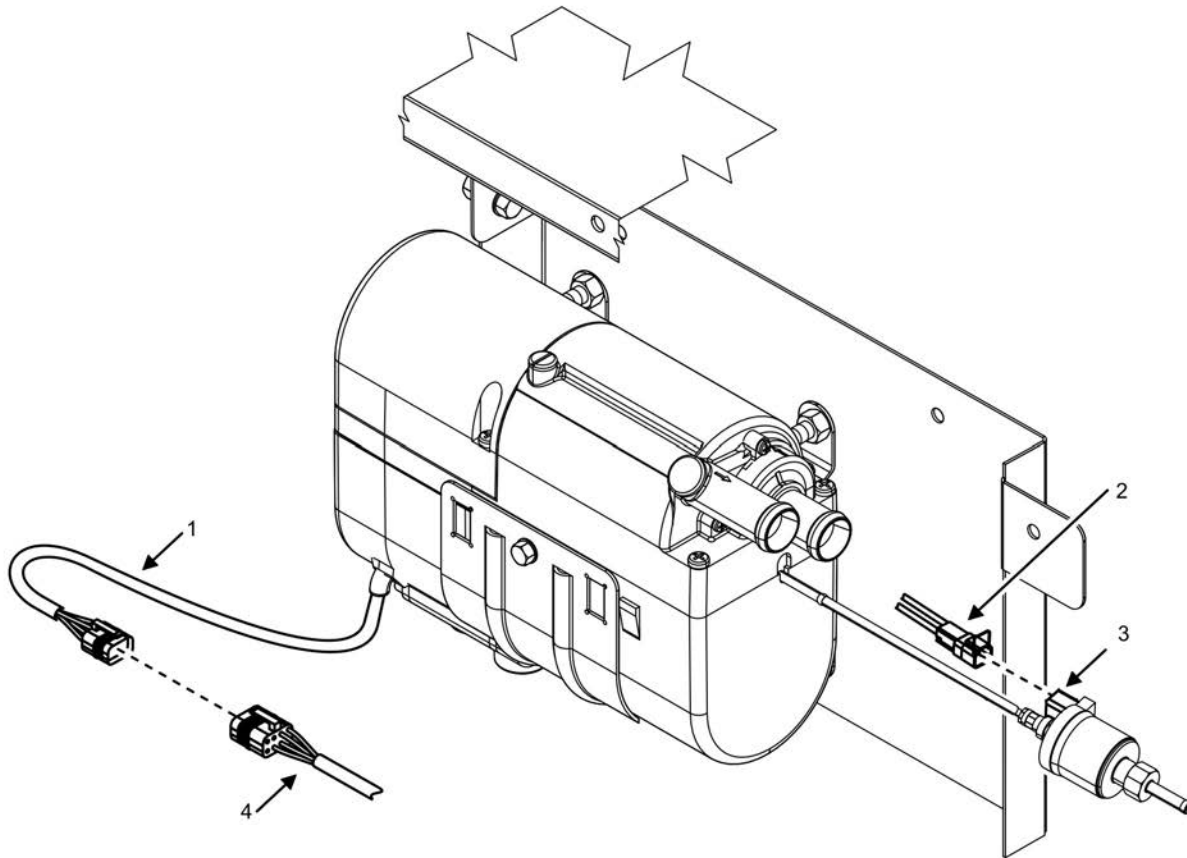
3. Open left-side door to expose intake-side of engine.
4. Disconnect electrical lead (P5) (Figure 2, Item 6) at battery current sensor (Figure 2, Item 7).





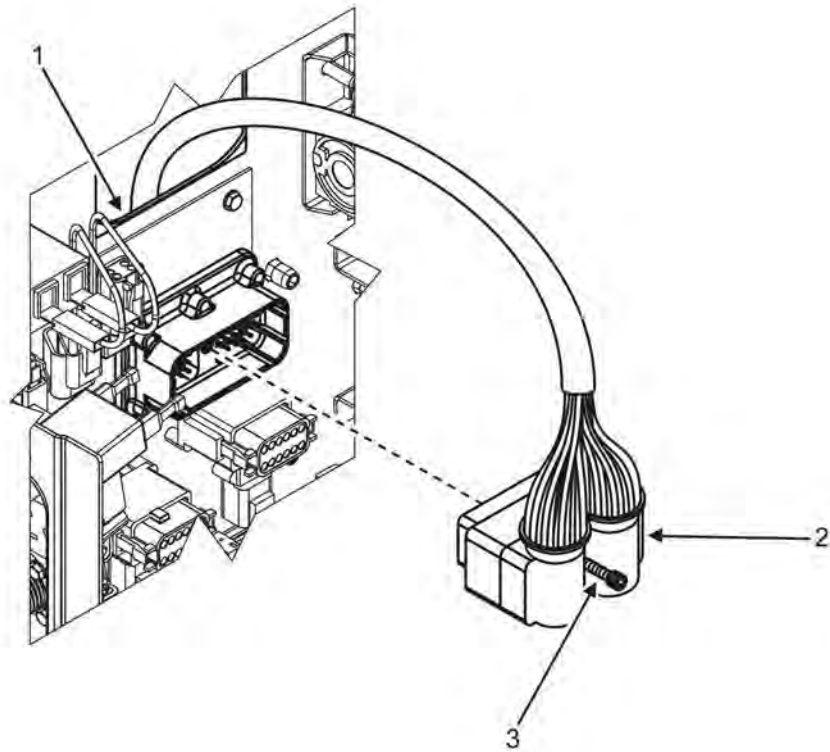
**Figure 2. Right-Side Door — Lower View.**

5. Remove screw (Figure 2, Item 9) and wire (L4-(+)) (Figure 2, Item 8) from starter (Figure 2, Item 1).
6. Remove nut (Figure 2, Item 5) and lock washer (Figure 2, Item 4) that secure wires (Figure 2, Items 2 and 3) to starter (Figure 2, Item 1).
7. Remove wires (Figure 2, Items 2 and 3) from starter (Figure 2, Item 1).
8. Inspect battery current sensor (Figure 2, Item 7) for damage. Remove battery current sensor (Figure 2, Item 7) and wire tie (not shown) from wire (Figure 2, Item 2). Replace as required.
9. Proceed to step 16 if winterization kit is not installed. If winterization kit is installed, proceed to next step.
10. Slide back boot on two wires (CB201-LOAD) (Figure 2, Item 12) at main DC circuit breaker (Figure 2, Item 14).
11. Remove nut (Figure 2, Item 10), two wires (CB201-LOAD) (Figure 2, Item 12), and lock washer (Figure 2, Item 11) from main DC circuit breaker (Figure 2, Item 14). Remove third wire (Figure 2, Item 13) from main DC circuit breaker (Figure 2, Item 14) for winterization kit (not shown).



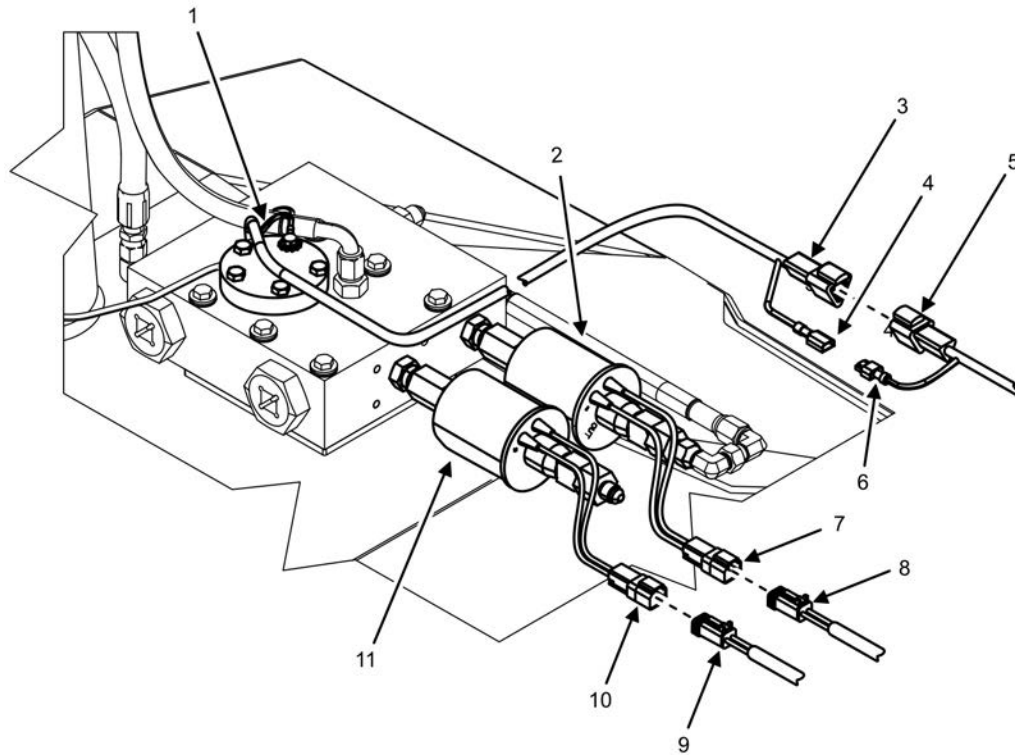
**Figure 3. Winterization Kit.**

12. Remove right-side panel (WP 0033, Remove/Install Right-Side Body Panel) if winterization kit is installed.
13. Disconnect electrical lead (P20A) (Figure 3, Item 4) to winterization kit pigtail (Figure 3, Item 1).
14. Disconnect electrical lead (P21) (Figure 3, Item 2) to winterization kit fuel pump (Figure 3, Item 3) by depressing metal clip.
15. Locate winterization kit bus plug electrical connector (J20C) (not shown) and spare (P75) on engine wiring harness near winterization kit fuel pump (Figure 3, Item 3).



**Figure 4. Right-Side Rear — Output Box View.**

16. Remove plastic protective panel to gain access to twin electrical connector (P500) (Figure 4, Item 2) in the output box (WP 0060, Remove/Install Voltage Selection Board).
17. Loosen screw (Figure 4, Item 3) that secures twin electrical connector (P500) (Figure 4, Item 2) inside output box. Push twin electrical connector (P500) (Figure 4, Item 2) through large slot in output box (Figure 4, Item 1) into rear of generator set.



**Figure 5. Rear Door — Fuel System.**

18. Remove connector (P60) (Figure 5, Item 8) from pigtail (Figure 5, Item 7) on auxiliary fuel pump (Figure 5, Item 2).
19. Remove connector (P70) (Figure 5, Item 5) from pigtail (Figure 5, Item 3) on fuel level sender (Figure 5, Item 1). Remove terminal connector (Figure 5, Item 6) from terminal connector (Figure 5, Item 4) on pigtail (Figure 5, Item 3) of fuel level sender (Figure 5, Item 1).
20. Remove connector (P65) (Figure 5, Item 9) from pigtail (Figure 5, Item 10) on main fuel pump (Figure 5, Item 11).
21. Push the three connectors (P1, P2, and P3) (Figure 6, Items 2, 3, and 4) and engine wiring harness to pass through the slot in radiator support panel (Figure 6, Item 1) into the rear of the generator set.

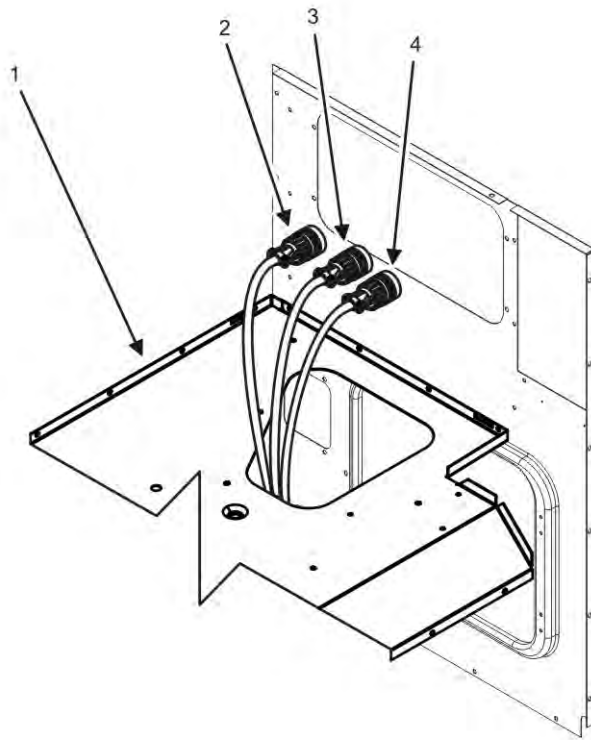


Figure 6. Rear of DCS.

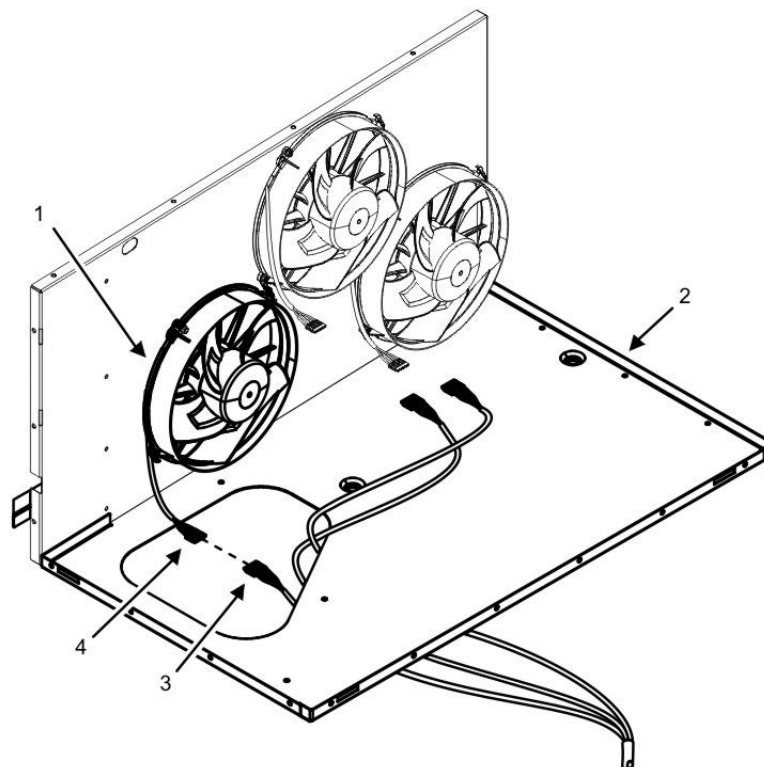
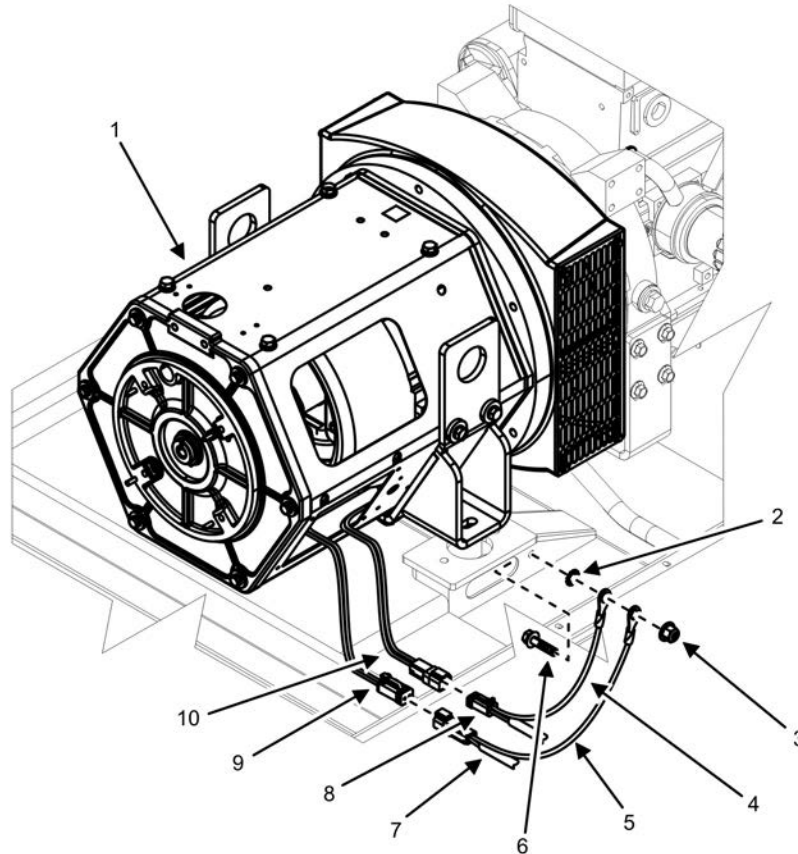


Figure 7. Cooling Fan Connectors.

## NOTE

There are three cooling fans on the 30 kW generator set. Each cooling fan is powered through a separate connector from the engine wiring harness. Figure 7 illustrates only one cooling fan disconnection for clarity.

22. Remove three wiring harness connectors (P96, P97, and P98) (Figure 7, Items 3) from pigtail (Figure 7, Item 4) on three cooling fans (Figure 7, Item 1), and allow the three connectors (Figure 7, Item 3) to pass through the slot in radiator support panel (Figure 7, Item 2) into the lower rear of the generator set.

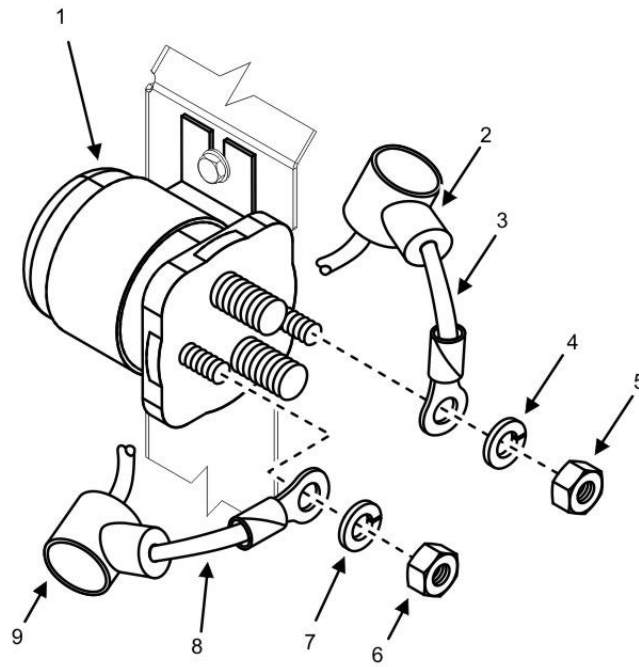


**Figure 8. AC Generator Connectors.**

## NOTE

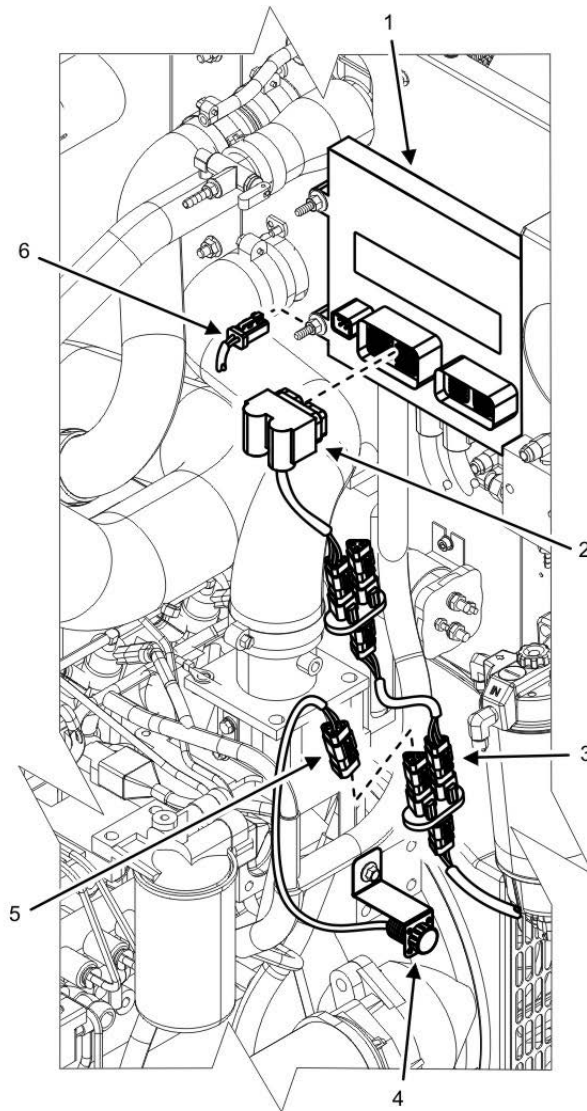
Both the 50/60 Hz and 400 Hz AC generators have pigtails that connect to the engine wiring harness. The 50/60 Hz AC generator has P90 (Figure 8, Item 8) and P85 (Figure 8, Item 7) connectors. The 400 Hz AC generator has P90 (Figure 8, Item 8) only. Only the 50/60 Hz AC generator (Figure 8, Item 1) is shown in Figure 8.

23. Remove connector (P90) (Figure 8, Item 8) from pigtail (Figure 8, Item 10) on AC generator (Figure 8, Item 1).
24. Remove connector (P85) (50/60 Hz generator set only) (Figure 8, Item 7) from pigtail (Figure 8, Item 9) on AC generator (Figure 8, Item 1).
25. Remove nut (Figure 8, Item 3), ground ring terminals (Figure 8, Items 4 and 5) of P85 (Figure 8, Item 7) and P90 (Figure 8, Item 8), and external tooth washer (Figure 8, Item 2) from skid ground bolt (Figure 8, Item 6). Discard external tooth washer (Figure 8, Item 2).



**Figure 9. Left-Side Door View.**

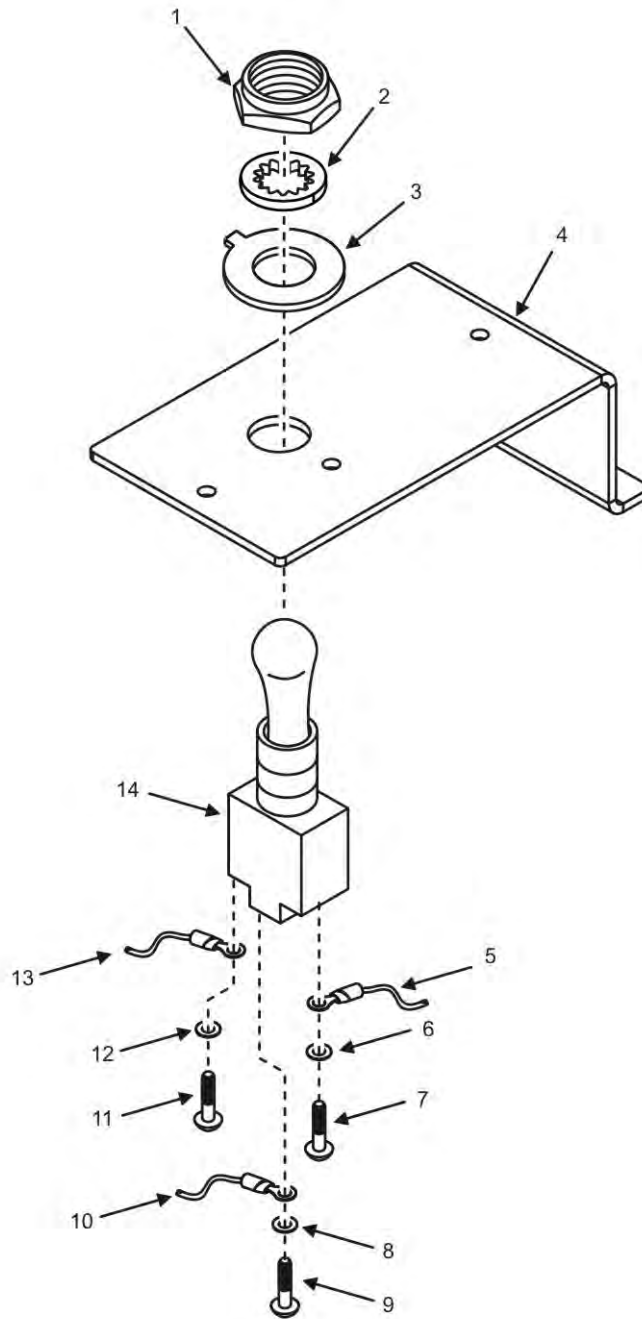
26. Reposition boot (Figure 9, Item 2) on wire (K18-(+)) (Figure 9, Item 3) to expose nut (Figure 9, Item 5) on intake air heater relay (Figure 9, Item 1).
27. Remove nut (Figure 9, Item 5), lock washer (Figure 9, Item 4), and wire (K18-(+)) (Figure 9, Item 3) from intake air heater relay (Figure 9, Item 1).
28. Reposition boot (Figure 9, Item 9) on wire (K18-(-)) (Figure 9, Item 8) to expose nut (Figure 9, Item 6) on intake air heater relay (Figure 9, Item 1).
29. Remove nut (Figure 9, Item 6), lock washer (Figure 9, Item 7), and wire (K18-(-)) (Figure 9, Item 8) from intake air heater relay (Figure 9, Item 1).



**Figure 10. Left-Side Door View.**

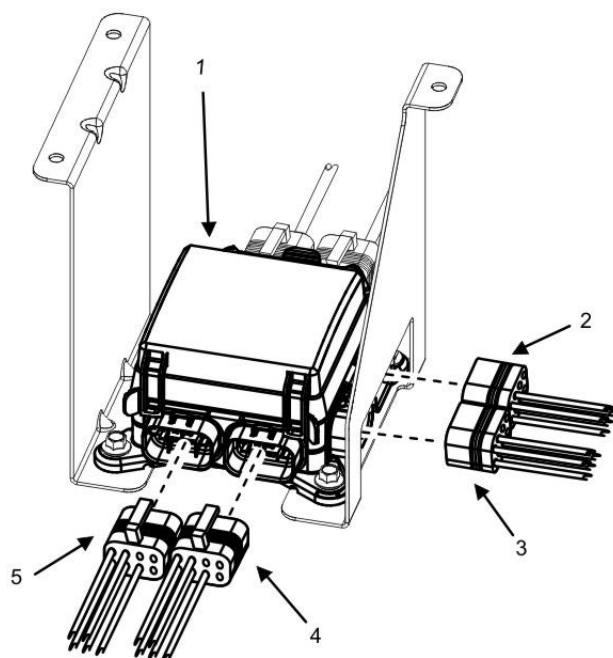
30. Remove connector (P101) (Figure 10, Item 6) from engine ECM (Figure 10, Item 1).
31. Ensure that connector P102 (Figure 10, Item 2) is tagged for later installation.
32. Loosen captive screw in connector P102 (Figure 10, Item 2) that secures connector P102 (Figure 10, Item 2) to ECM (Figure 10, Item 1).
33. Remove connector (Figure 10, Item 2) from ECM (Figure 10, Item 1).
34. Remove and tag ECM diagnostic port (Figure 10, Item 4) connector J108 (Figure 10, Item 5) from connector J102 (Figure 10, Item 3).





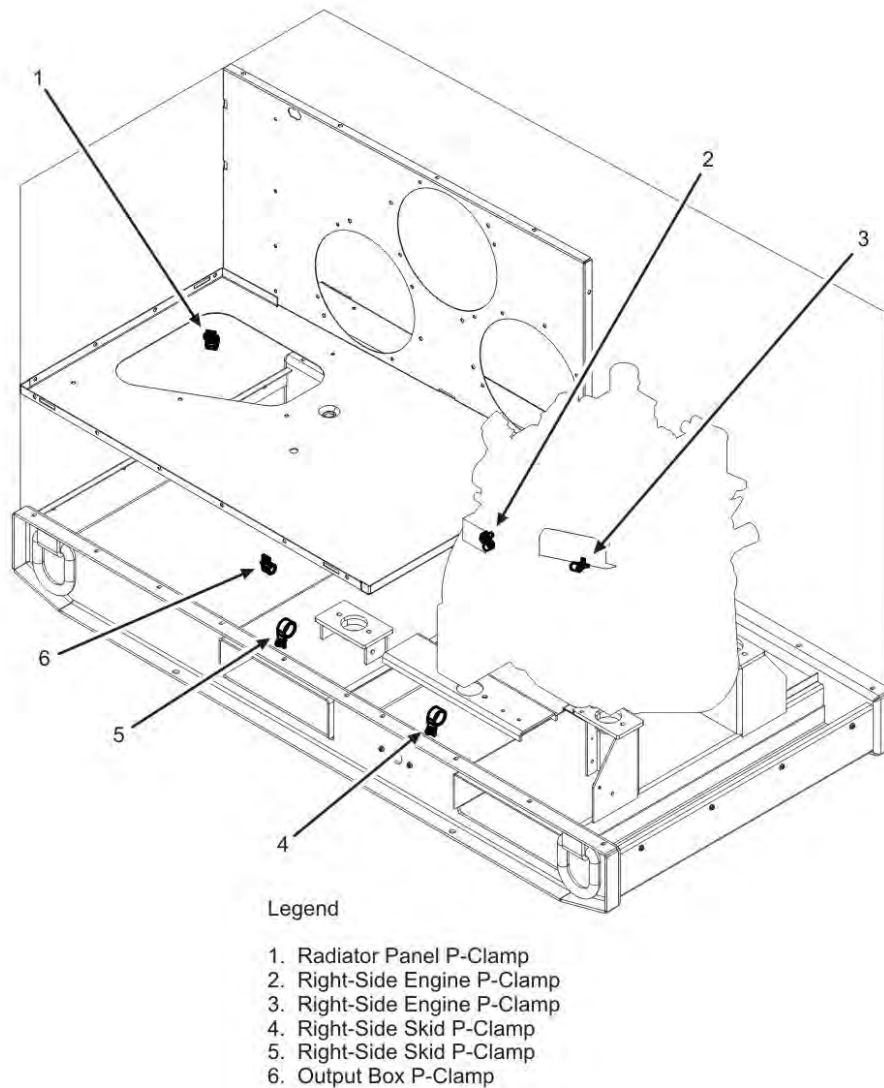
**Figure 11. Dead Crank Switch.**

35. Remove nut (Figure 11, Item 1) and washers (Figure 11, Items 2 and 3) that secures DEAD CRANK SWITCH (Figure 11, Item 14) to its mounting bracket (Figure 11, Item 4).
36. Remove DEAD CRANK SWITCH (Figure 11, Item 14) from mounting bracket (Figure 11, Item 4).
37. Remove three screws (Figure 11, Items 7, 9, and 11) and three washers (Figure 11, Items 6, 8, and 12) that secure three wires (Figure 11, Items 5, 10, and 13) at the rear of DEAD CRANK SWITCH (Figure 11, Item 14).
38. Remove three wires (Figure 11, Items 5, 10, and 13) from DEAD CRANK SWITCH (Figure 11, Item 14).



**Figure 12. Relay Panel Connectors.**

39. Open rear door and locate relay panel (Figure 12, Item 1).
40. Remove connector (P5A) (Figure 12, Item 5) from relay panel (Figure 12, Item 1).
41. Remove connector (P5B) (Figure 12, Item 4) from relay panel (Figure 12, Item 1).
42. Remove connector (P5C) (Figure 12, Item 3) from relay panel (Figure 12, Item 1).
43. Remove connector (P5D) (Figure 12, Item 2) from relay panel (Figure 12, Item 1).

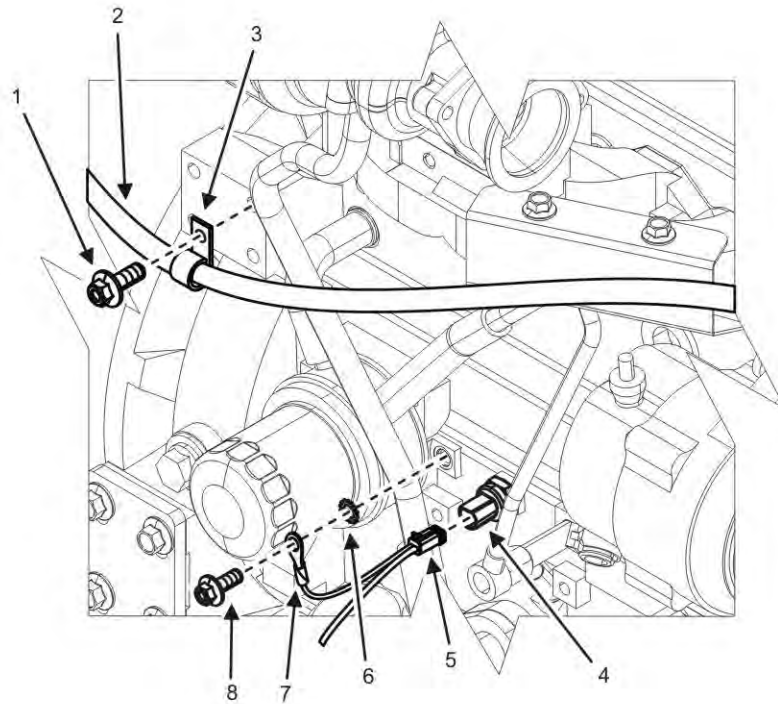


**Figure 13. P-Clamp Location.**

**NOTE**

Engine wiring harness is secured to unit skid in several places using P-clamps. P-clamps must be installed to unit skid to secure the engine wiring harness. When removing P-clamps, start at front of generator set and work toward rear. There are six P-clamps that need to be removed in order to remove wiring harness.

44. Locate P-clamps starting at front of generator set and working toward rear (Figure 13).



**Figure 14. P-Clamp Installation.**

45. Remove screws (Figure 14, Item 2) that secure P-clamps (Figure 14, Item 1) to unit skid.
46. Remove P-clamps (Figure 14, Item 1) from engine wiring harness (Figure 14, Item 3) for reuse.
47. Remove P40 connector (Figure 14, Item 5) from oil pressure sender (Figure 14, Item 4).
48. Remove bolt (Figure 14, Item 8), washer (Figure 14, Item 6), and ground wire (Figure 14, Item 7) from engine.
49. Remove engine wiring harness (Figure 1) from unit skid being careful not to entangle electrical leads on unit components.

**END OF TASK**

**Inspect Engine Wiring Harness**

1. Inspect engine wiring harness (Figure 1) for damaged connectors and sheathing if harness is to be reused.
2. Repair damaged electrical connectors (WP 0100, General Maintenance).
3. Replace damaged sheathing as required.

**END OF TASK**

---

## Install Engine Wiring Harness

### CAUTION

Use tags/markings applied to electrical components prior to removal as guides to installation. Leave tags/markings in place until all components have been installed and the equipment is operating properly.

1. Open left- and right-side doors
2. Position engine wiring harness (Figure 1) to its approximate mounting location in unit skid, spreading branches of harness close to their points of installation.
3. Install P40 connector (Figure 14, Item 5) to oil pressure sender (Figure 14, Item 4) on engine.
4. Install ground wire (Figure 14, Item 7) and bolt (Figure 14, Item 8) from engine. Torque bolt (Figure 14, Item 7) to 34 – 42 ft/lb (47 – 57 Nm).
5. Install connector (P5D) (Figure 12, Item 2) to relay panel (Figure 12, Item 1).
6. Install connector (P5C) (Figure 12, Item 3) to relay panel (Figure 12, Item 1).
7. Install connector (P5B) (Figure 12, Item 4) to relay panel (Figure 12, Item 1).
8. Install connector (P5A) (Figure 12, Item 5) to relay panel (Figure 12, Item 1).
9. Position three wires (Figure 11, Items 5, 10, and 13) to their mounting locations on rear of DEAD CRANK SWITCH (Figure 11, Item 14) and secure by installing three screws (Figure 11, Items 7, 9, and 11) and three washers (Figure 11, Items 6, 8, and 12).
10. Position DEAD CRANK SWITCH (Figure 11, Item 14) to its mounting location on bracket (Figure 11, Item 4) and secure by installing washers (Figure 11, Items 2 and 3) and nut (Figure 11, Item 1).
11. Install ECM diagnostic port (Figure 10, Item 4) connector J108 (Figure 10, Item 5) to connector J102 (Figure 10, Item 3).
12. Position connector (Figure 10, Item 2) to its mounting location on ECM (Figure 10, Item 1) and secure by tightening captive screw in connector (Figure 10, Item 2).
13. Install connector (P101) (Figure 10, Item 6) to engine ECM (Figure 10, Item 1).
14. Position wire (K18-(-)) (Figure 9, Item 8) to air intake heater relay (Figure 9, Item 1) and secure by installing lock washer (Figure 9, Item 7) and nut (Figure 9, Item 6).
15. Position boot (Figure 9, Item 9) on wire (K18-(-)) (Figure 9, Item 8) to cover nut (Figure 9, Item 6).
16. Position wire (K18-(+)) (Figure 9, Item 3) to terminal on air intake heater relay (Figure 9, Item 1) and secure by installing lock washer (Figure 9, Item 4) and nut (Figure 9, Item 5).
17. Position boot (Figure 9, Item 2) on wire (K18-(+)) (Figure 9, Item 3) to cover nut (Figure 9, Item 5).
18. Install connector (P85) (50/60 Hz generator set only) (Figure 8, Item 7) to pigtail (Figure 8, Item 9) of AC generator (Figure 8, Item 1).
19. Install connector (P90) (Figure 8, Item 8) to pigtail (Figure 8, Item 10) of AC generator (Figure 8, Item 1).
20. Install bolt (Figure 8, Item 6) and ground ring terminals (Figure 8, Items 4 and 5) of P85 (Figure 8, Item 7) and P90 (Figure 8, Item 8) to skid with new external tooth washer (Figure 8, Item 2) and nut (Figure 8, Item 3). Torque bolt (Figure 8, Item 6) to 34 – 42 ft/lb (47 – 57 Nm).
21. Pass three connectors (P96, P97, and P98) (Figure 7, Items 3) up through slot in radiator support panel (Figure 7, Item 2) into upper rear of generator set.
22. Install three connectors (P96, P97, and P98) (Figure 7, Items 3) to pigtails (Figure 7, Item 4) of three cooling fans (Figure 7, Item 1).

23. Pass three connectors (P1, P2, and P3) (Figure 6, Items 2, 3, and 4) up through slot in radiator support panel (Figure 6, Item 1) into upper rear of generator set.
24. Install connector (P65) (Figure 5, Item 9) to pigtail (Figure 5, Item 10) of main fuel pump (Figure 5, Item 11).
25. Install connector (P70) (Figure 5, Item 5) to pigtail (Figure 5, Item 3) of fuel level sender (Figure 5, Item 1). Install terminal connector (Figure 5, Item 6) to terminal connector (Figure 5, Item 4) on pigtail (Figure 5, Item 3) of fuel level sender (Figure 5, Item 1).
26. Install connector (P60) (Figure 5, Item 8) to pigtail (Figure 5, Item 7) of auxiliary fuel pump (Figure 5, Item 2).
27. Open output box door.
28. Push twin electrical connector (P500) (Figure 4, Item 2) through slot into output box (Figure 4, Item 1).
29. Connect twin electrical connector (P500) (Figure 4, Item 2) to its mating connector in output box and secure by installing screw (Figure 4, Item 3).
30. Install plastic protective panel to in output box (WP 0060, Remove/Install Voltage Selection Board).

### NOTE

If generator set is equipped with a winterization kit, the right-side panel should already have been removed. If no winterization kit is installed, proceed to step 38.

31. Connect winterization kit fuel pump lead (P21) (Figure 3, Item 2) to winterization kit fuel pump (Figure 3, Item 3).
32. Connect winterization kit electrical lead (P20A) (Figure 3, Item 4) to winterization kit pigtail (Figure 3, Item 1).
33. Place winterization kit buss plug connector (not shown) in unit skid close to winterization kit fuel pump (Figure 3, Item 3).
34. Install wire (Figure 2, Item 13) for winterization kit to main DC circuit breaker (Figure 2, Item 14).
35. Install two wires (CB201-LOAD) (Figure 2, Item 12), lock washer (Figure 2, Item 11), and nut (Figure 2, Item 10) to main DC circuit breaker (Figure 2, Item 14).
36. Slide boot back on two wires (CB201-LOAD) (Figure 2, Item 12) at main DC circuit breaker (Figure 2, Item 14).
37. Install right-side body panel if removed (WP 0033, Remove/Install Right-Side Body Panels).
38. Install battery current sensor (Figure 2, Item 7) to wire (Figure 2, Item 2) and secure with wire tie as required.
39. Install wires (Figure 2, Items 2 and 3) to starter (Figure 2, Item 1) and secure by installing lock washer (Figure 2, Item 4) and nut (Figure 2, Item 5).
40. Install wire (L4-(+)) (Figure 2, Item 8) to starter (Figure 2, Item 1) with screw (Figure 2, Item 9).
41. Connect electrical lead (P5) (Figure 2, Item 6) to battery current sensor (Figure 2, Item 7).

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**NOTE**

Engine wiring harness is secured to unit skid in several places using P-clamps. P-clamps must be installed to unit skid to secure the engine wiring harness. There are six P-clamps that need to be installed in order to secure wiring harness.

42. Install P-clamps (Figure 14, Item 1) to engine wiring harness (Figure 14, Item 3) at required locations (Figure 13).
43. Position P-clamps (Figure 14, Item 1) to mounting location on unit skid and secure by installing screws (Figure 14, Item 2).
44. Close left- and right-side doors.
45. Install wire connector P15 to battery-charging alternator IAW tags (WP 0079, Remove/Install Battery-Charging Alternator).
46. Install wiring to circuit breaker (UOC 98M only) IAW tags (WP 0065, Remove/Install Circuit Breaker).
47. Install front body panel (WP 0030, Remove/Install Front Body Panel).
48. Install DCS (WP 0017, Remove/Install DCS).
49. Install top body panel (WP 0029, Remove/Install Top Body Panel).
50. Install battery ground cable (WP 0037, Remove/Install Batteries).
51. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
52. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
53. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**





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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL POWER WIRING HARNESS**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Harness, power (WP 0171, Repair Parts List, Figure 66, Item 1)

Insulation sleeving (WP 0171, Figure 66, Item 7)

Washer, lock (WP 0148, Repair Parts List, Figure 43, Item 2)

Grease, electrically conductive (WP 0180, Expendable and Durable Items List, Item 22)

Tag, marker (WP 0180, Expendable and Durable Items List, Item 37)

**Personnel Required**

91D (1)

**References**

WP 0100, General Maintenance

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Left-side body panel removed (WP 0032, Remove/Install Left-Side Body Panels)

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**REMOVE/INSTALL POWER WIRING HARNESS****Remove Power Wiring Harness**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left- and right-side doors.
3. Locate power wiring harness (Figure 1).

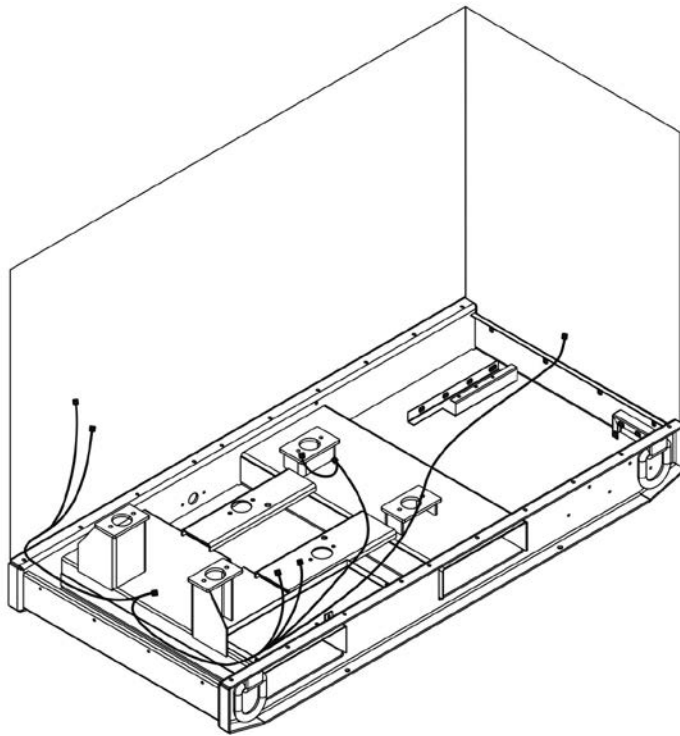


Figure 1. Power Wiring Harness — Location.

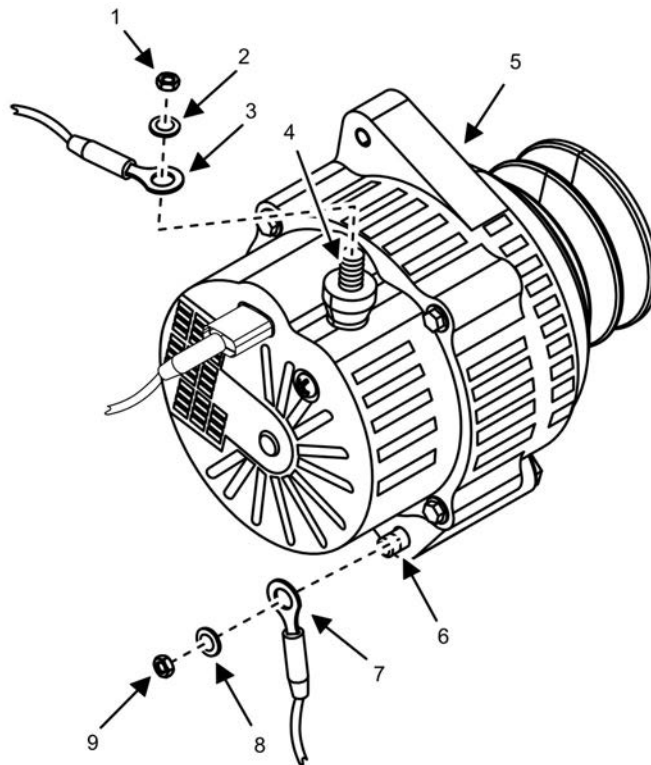
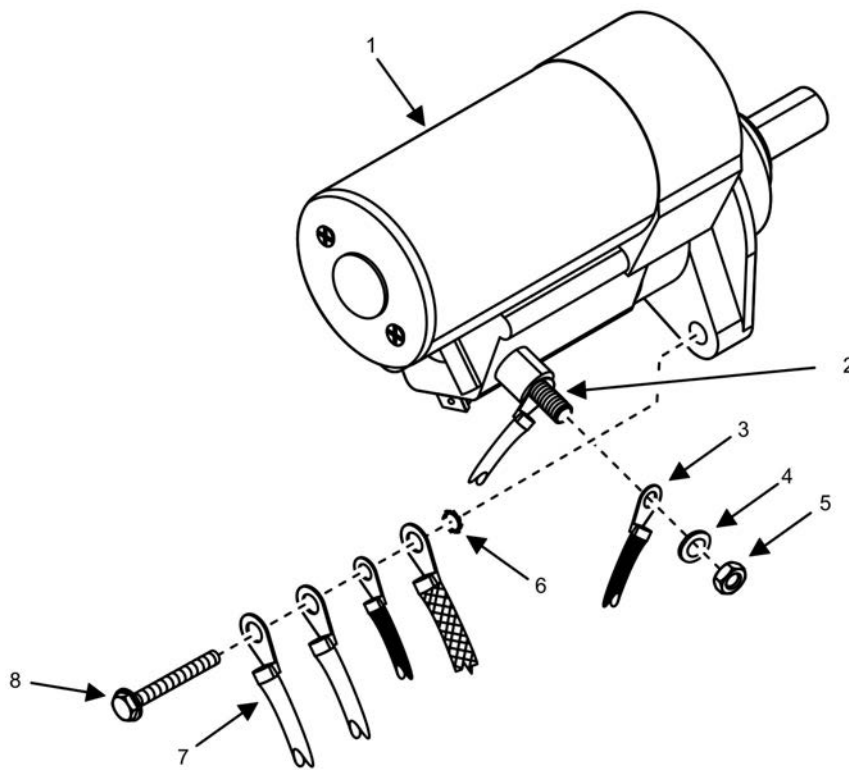


Figure 2. Battery-Charging Alternator Connections.

**NOTE**

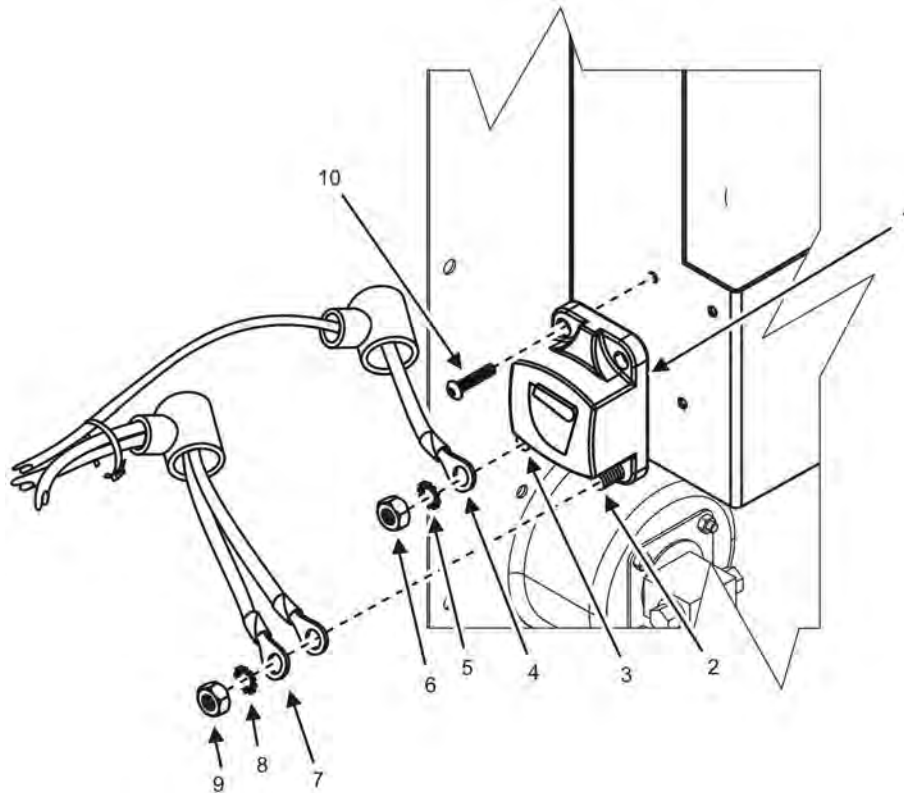
Tag/mark all electrical wires prior to removal. Tags will serve as a guide during installation.

4. Reposition boot (not shown) at B+ stud (Figure 2, Item 4) of battery-charging alternator (Figure 2, Item 5) to expose nut (Figure 2, Item 1).
5. Remove nut (Figure 2, Item 1) and lock washer (Figure 2, Item 2) at B+ stud (Figure 2, Item 4) of battery-charging alternator (Figure 2, Item 5) and remove wire (G2-B) (Figure 2, Item 3).
6. Reposition boot (not shown) at ground screw (Figure 2, Item 6) of battery-charging alternator (Figure 2, Item 5) to expose nut (Figure 2, Item 9).
7. Remove nut (Figure 2, Item 9) and internal tooth lock washer (Figure 2, Item 8) from ground screw (Figure 2, Item 6) and remove wire (G2-GND) (Figure 2, Item 7).



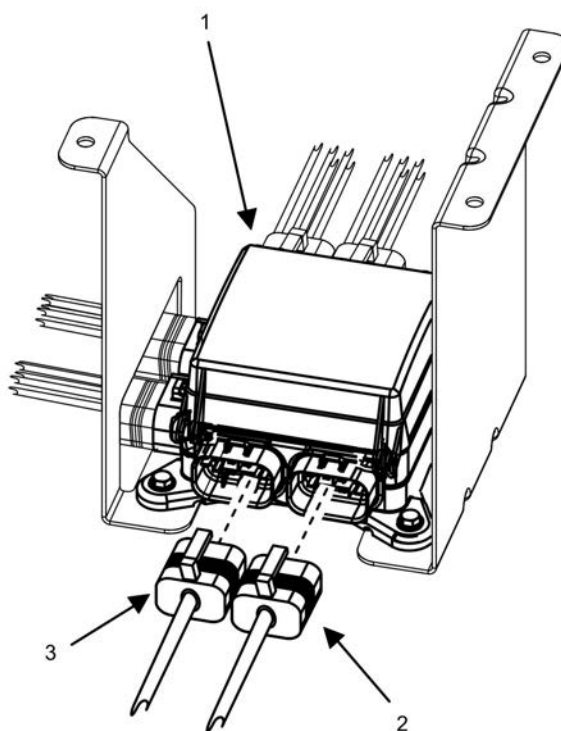
**Figure 3. Starter Connections.**

8. Reposition boot (not shown) at B+ stud (Figure 3, Item 2) of starter (Figure 3, Item 1) to expose nut (Figure 3, Item 5).
9. Remove nut (Figure 3, Item 5), lock washer (Figure 3, Item 4), and wire (L4-1) (Figure 3, Item 3) from B+ stud (Figure 3, Item 2) of starter (Figure 3, Item 1).
10. Reinstall nut (Figure 3, Item 5) and other wire to B+ stud (Figure 3, Item 2) of starter (Figure 3, Item 1) temporarily.
11. Remove lower mounting screw (Figure 3, Item 8) and external tooth lock washer (Figure 3, Item 6) from starter (Figure 3, Item 1) and remove two wires (B1-(-)) (Figure 3, Item 7). Discard external tooth lock washer (Figure 3, Item 6).
12. Reinstall lower mounting screw (Figure 3, Item 8) and other wires to starter (Figure 3, Item 1) temporarily.



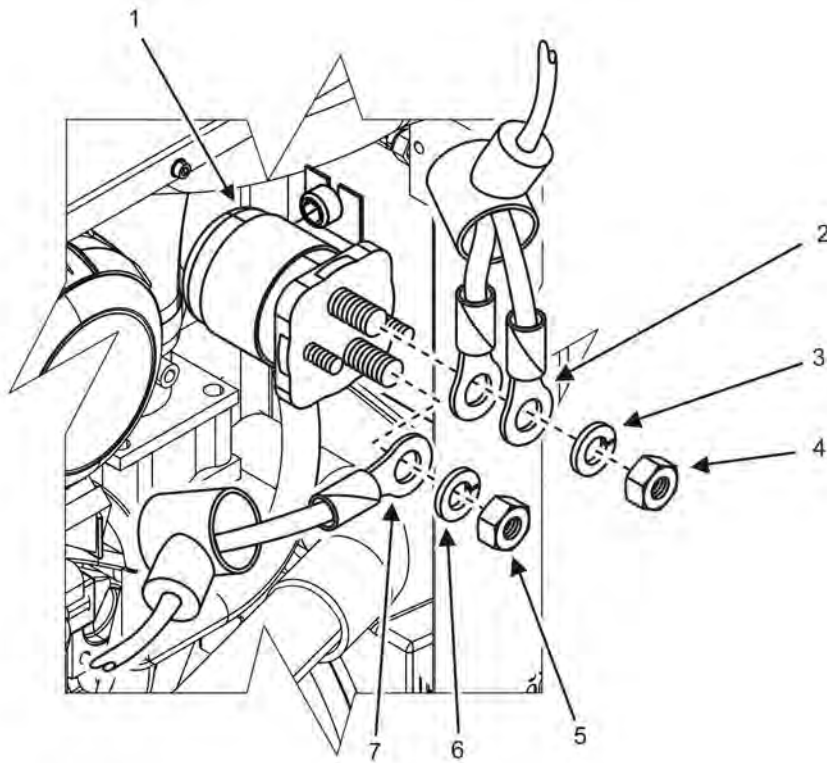
**Figure 4. Main DC Circuit Breaker.**

13. Remove three screws (Figure 2, Item 10) securing main DC circuit breaker (Figure 2, Item 1) to generator set.
14. Reposition boot (not shown) at LOAD terminal (Figure 4, Item 2) of main DC circuit breaker (Figure 4, Item 1) to expose nut (Figure 4, Item 9).
15. Remove nut (Figure 4, Item 9) and lock washer (Figure 4, Item 8) at LOAD terminal (Figure 4, Item 2) of main DC circuit breaker (Figure 4, Item 1) and remove two wires (CB201-LOAD) (Figure 4, Item 7).
16. Reposition boot at LINE terminal (Figure 4, Item 3) of main DC circuit breaker (Figure 4, Item 1) to expose nut (Figure 4, Item 6).
17. Remove nut (Figure 4, Item 6) and lock washer (Figure 4, Item 5) at LINE terminal (Figure 4, Item 3) of main DC circuit breaker (Figure 4, Item 1) and remove wire (CB201-LINE) (Figure 4, Item 4).



**Figure 5. Relay Panel Connectors.**

18. Remove connector (P10) (Figure 5, Item 3) from relay panel (Figure 5, Item 1).
19. Remove connector (P11) (Figure 5, Item 2) from relay panel (Figure 5, Item 1).

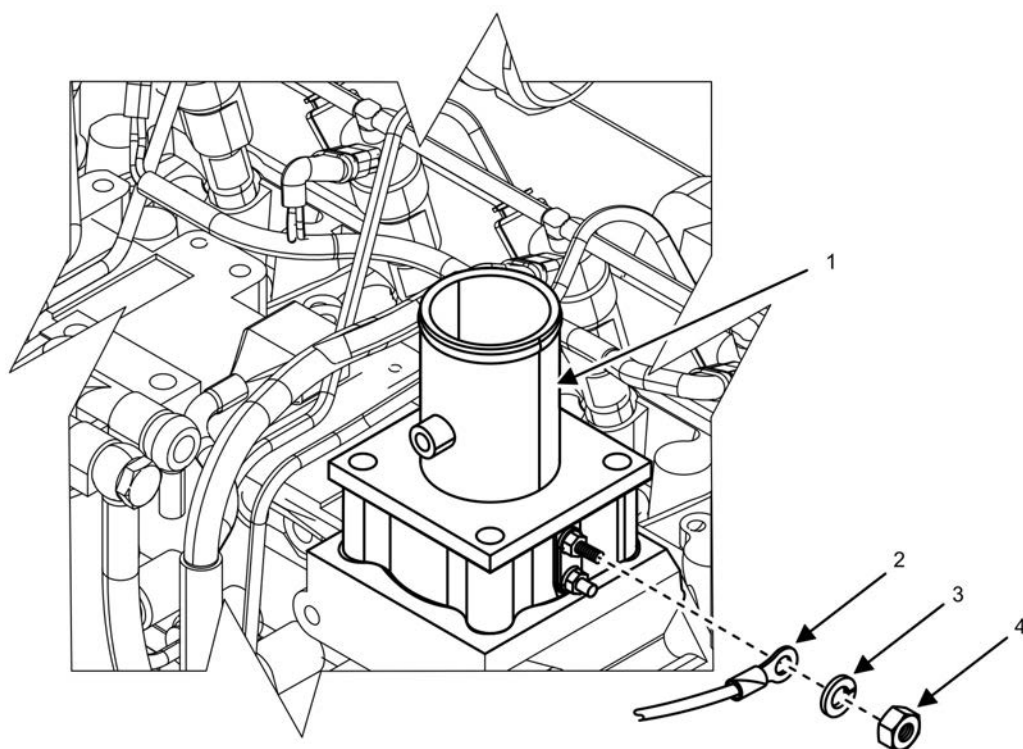


**Figure 6. Intake Air Heater Relay.**

**NOTE**

Wires attached to the two small terminals of intake air heater relay are not shown in Figure 6 for clarity.

20. Reposition boot on wires (K18-1) (Figure 6, Item 2) at B+ terminal of intake air heater relay (Figure 6, Item 1) to expose nut (Figure 6, Item 4).
21. Remove nut (Figure 6, Item 4) and lock washer (Figure 6, Item 3) at B+ terminal of intake air heater relay (Figure 6, Item 1) and remove wires (K18-1) (Figure 6, Item 2).
22. Reposition boot on wire (K18-2) (Figure 6, Item 7) at S terminal of intake air heater relay (Figure 6, Item 1) to expose nut (Figure 6, Item 5).
23. Remove nut (Figure 6, Item 5) and lock washer (Figure 6, Item 6) at S terminal of intake air heater relay (Figure 6, Item 1) and remove wire (K18-2) (Figure 6, Item 7).

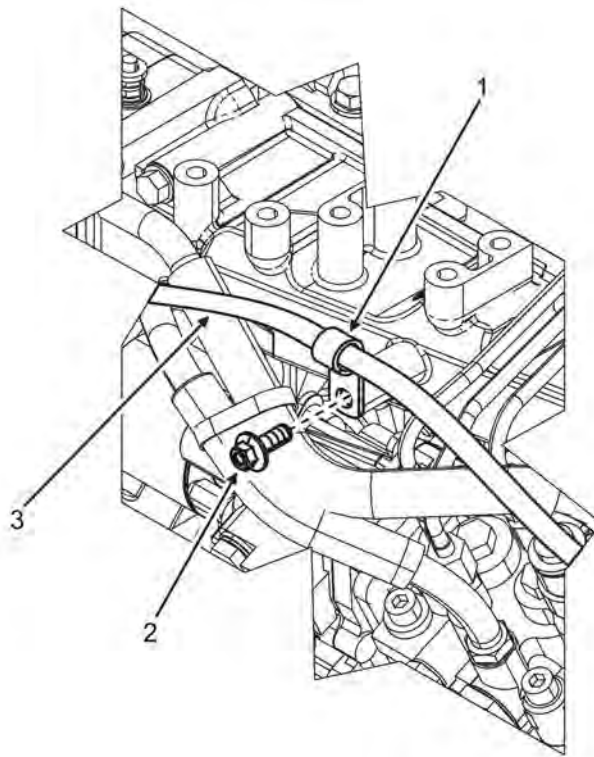


**Figure 7. Intake Air Heater.**

**NOTE**

Intake air hose is not shown in Figure 7 for clarity.

24. Reposition boot (not shown) on wire (HTR-(+)) (Figure 7, Item 2) on terminal of intake air heater (Figure 7, Item 1) to expose nut (Figure 7, Item 4).
25. Remove nut (Figure 7, Item 4) and lock washer (Figure 7, Item 3) from terminal of intake air heater (Figure 7, Item 1) and remove wire (HTR-(+)) (Figure 7, Item 2) from intake air heater (Figure 7, Item 1).



**Figure 8. P-Clamp Installation.**

### **NOTE**

Power wiring harness is secured to unit skid in several places using two P-clamps. P-clamps must be removed from unit skid prior to removal of the power wiring harness. Removal process for all P-clamps is the same.

26. Remove two screws (Figure 8, Item 2) that secures two P-clamps (Figure 8, Item 1) to unit skid.
27. Remove two P-clamps (Figure 8, Item 1) from power wiring harness (Figure 8, Item 3) for reuse.
28. Remove power wiring harness (Figure 1) from unit skid, being careful not to entangle harness leads on unit components.

### **END OF TASK**

#### **Inspect Power Wiring Harness**

1. Inspect power wiring harness (Figure 1) for damaged wires, connectors, and sheathing if harness is to be reused.
2. Repair damaged electrical connectors (WP 0100, General Maintenance).
3. Replace damaged sheathing as required.

### **END OF TASK**



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## Install Power Wiring Harness

1. Position power wiring harness (Figure 1) to its approximate mounting location in unit skid, spreading branches of harness close to their points of installation.

### NOTE

Tags/markings applied to electrical wires during removal should remain in place until all components are installed and equipment is operating properly.

2. Install wire (HTR-(+)) (Figure 7, Item 2) to terminal of intake air heater (Figure 7, Item 1) and secure by installing nut (Figure 7, Item 4) and lock washer (Figure 7, Item 3). Torque nut (Figure 7, Item 4) to 7 – 8 ft/lb (10 to 12 Nm). Position boot to cover nut (Figure 7, Item 1).
3. Install wire (K18-2) (Figure 6, Item 7) to S terminal of intake air heater relay (Figure 6, Item 1) and secure by installing lock washer (Figure 6, Item 6) and nut (Figure 6, Item 5). Position boot to cover nut (Figure 6, Item 5).
4. Install wires (K18-1) (Figure 6, Item 2) to B+ terminal of intake air heater relay (Figure 6, Item 1) and secure by installing lock washer (Figure 6, Item 3) and nut (Figure 6, Item 4). Position boot to cover nut (Figure 6, Item 4).
5. Install connector (P11) (Figure 5, Item 2) to relay panel (Figure 5, Item 1).
6. Install connector (P10) (Figure 5, Item 3) to relay panel (Figure 5, Item 1).
7. Install wire (CB 201- LINE) (Figure 4, Item 4) to LINE terminal (Figure 4, Item 3) of main DC circuit breaker (Figure 4, Item 1) and secure by installing lock washer (Figure 4, Item 5) and nut (Figure 4, Item 6). Reposition boot to cover nut (Figure 4, Item 6).
8. Position two wires (CB 201-LOAD) (Figure 4, Item 7) to LOAD terminal (Figure 4, Item 2) of main DC circuit breaker (Figure 4, Item 1) and secure by installing lock washer (Figure 4, Item 8) and nut (Figure 4, Item 9). Reposition boot to cover nut (Figure 4, Item 9).
9. Position main DC circuit breaker (Figure 4, Item 2) to its mounting location on generator set and align the mounting holes.
10. Secure main DC circuit breaker (Figure 4, Item 1) to generator set by installing three screws (Figure 4, Item 10).
11. Remove lower mounting screw (Figure 2, Item 8) from starter (Figure 2, Item 1).
12. Install two wires (B1-(-)) (Figure 2, Item 7) to lower mounting screw (Figure 2, Item 8) of starter (Figure 2, Item 1).
13. Install lower mounting screw (Figure 2, Item 8) and all wires, plus new external tooth lock washer (Figure 3, Item 6) to secure starter (Figure 2, Item 1) to engine. Reposition boot (not shown) to cover lower mounting screw (Figure 2, Item 8).
14. Remove nut from B+ stud (Figure 3, Item 2) of starter (Figure 3, Item 1).
15. Install wire (L4-1) (Figure 3, Item 3) (ensuring existing wire (not shown) is installed), and lock washer (Figure 3, Item 4) to B+ (Figure 3, Item 2) stud of starter (Figure 3, Item 1) and secure by installing nut (Figure 3, Item 5). Reposition boot (not shown) to cover nut (Figure 3, Item 5).
16. Install wire (G2-GND) (Figure 2, Item 7) to ground screw (Figure 2, Item 6) of battery-charging alternator (Figure 2, Item 5) and secure by installing new internal tooth washer (Figure 2, Item 8) and nut (Figure 2, Item 9). Reposition boot to cover nut (Figure 2, Item 9).
17. Install wire (G2-B) (Figure 2, Item 3) to B+ stud (Figure 2, Item 4) of battery-charging alternator (Figure 2, Item 5) and secure by installing lock washer (Figure 2, Item 2) and nut (Figure 2, Item 1). Reposition boot to cover nut (Figure 2, Item 1).

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**NOTE**

Engine wiring harness is secured to unit skid in several places using two P-clamps. P-clamps must be installed to unit skid to secure the engine wiring harness.

18. Install two P-clamps (Figure 8, Item 1) to power wiring harness (Figure 8, Item 3).
19. Position two P-clamps (Figure 8, Item 1) to mounting locations on unit skid and secure by installing two screws (Figure 8, Item 2).
20. Install left-side body panel (WP 0032, Remove/Install Left-Side Body Panel).
21. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
22. Close left- and right-side doors.
23. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
24. Start engine and check for proper operation (TM 9-6115-752-10).
25. Repair as required.
26. Remove all temporary identification tags applied to electrical components.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL MAIN DC CIRCUIT BREAKER**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Circuit breaker (WP 0107, Repair Parts List, Figure 2, Item 22)

Grease, electrically conductive (WP 0180, Expendable and Durable Items List, Item 22)

Tag, marker (WP 0180, Item 37)

**Personnel Required**

91D (1)

Assistant (1)

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**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Access panel removed (WP 0030, Remove/Install Front Body Panel)

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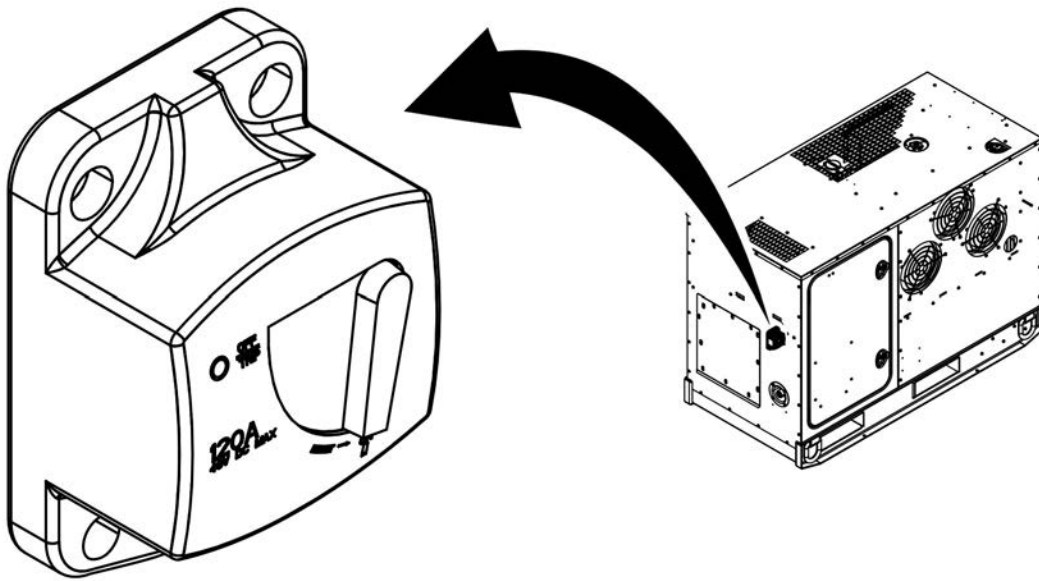
**REMOVE/INSTALL MAIN DC CIRCUIT BREAKER****WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

**NOTE**

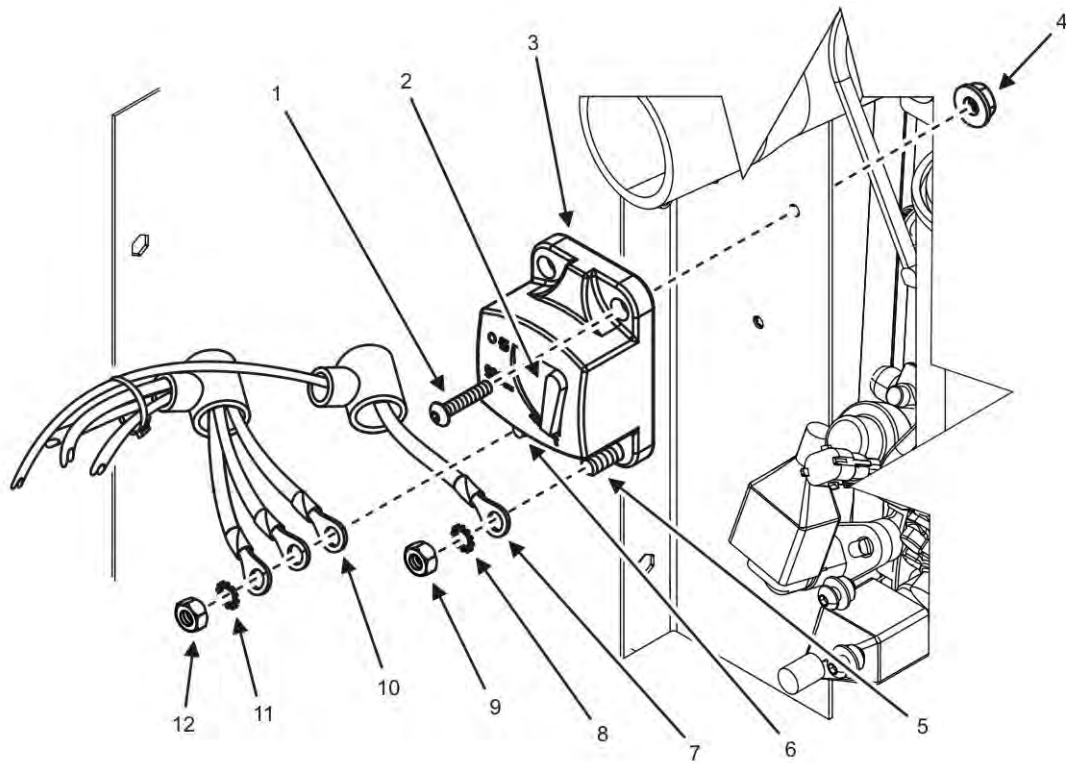
The main DC breaker can be tested for continuity while installed or when removed from the unit but must be installed when testing for short to ground. Multimeter readings should be the same as noted below. To test the breaker without removing it from the unit, see Test Main DC Circuit Breaker task.

## Remove Main DC Circuit Breaker



**Figure 1. Main DC Circuit Breaker — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door and locate main DC circuit breaker (Figure 1) mounted on drive belt guard.
3. Set main DC circuit breaker switch (Figure 2, Item 2) to OFF position.



**Figure 2. Main DC Circuit Breaker — Removal.**

4. Remove protective caps from wires (Figure 2, Item 10) on load (left-side) terminal (Figure 2, Item 6) and from wire (Figure 2, Item 7) on line (right-side) terminal (Figure 2, Item 5) on the main DC circuit breaker (Figure 2, Item 3).

### **NOTE**

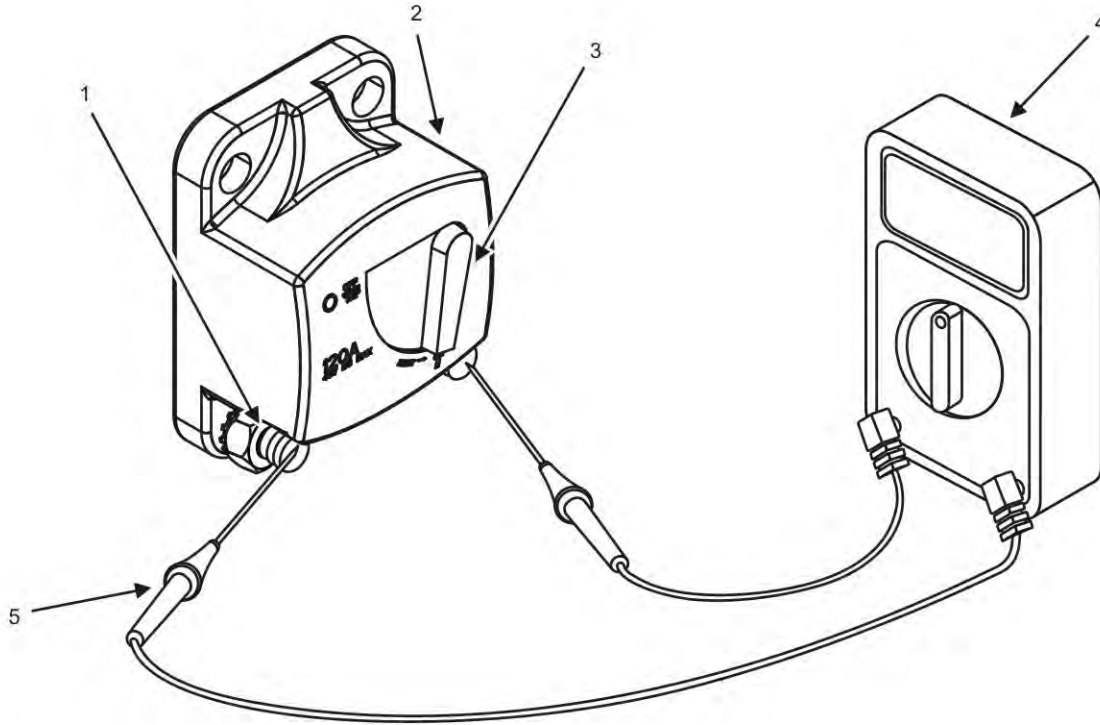
To assist installation, tag all wires and connectors prior to removal.

5. Tag and disconnect wires (Figure 2, Item 10) attached to load (left-side) terminal (Figure 2, Item 6) of main DC circuit breaker (Figure 2, Item 3) by removing nut (Figure 2, Item 12) and lock washer (Figure 2, Item 11).
6. Tag and disconnect wire (Figure 2, Item 7) attached to line (right-side) terminal (Figure 2, Item 5) of main DC circuit breaker (Figure 2, Item 3) by removing nut (Figure 2, Item 9) and lock washer (Figure 2, Item 8).
7. Remove three socket head screws (Figure 2, Item 1) and three flange nuts (Figure 2, Item 4) securing main DC circuit breaker (Figure 2, Item 3) to belt guard.
8. Remove main DC circuit breaker (Figure 2, Item 3) from belt guard and place on a suitable work surface or discard if being replaced.

**END OF TASK**

### Test Main DC Circuit Breaker

1. Inspect main DC circuit breaker (Figure 2, Item 3) for signs of damage or corrosion and replace as required.



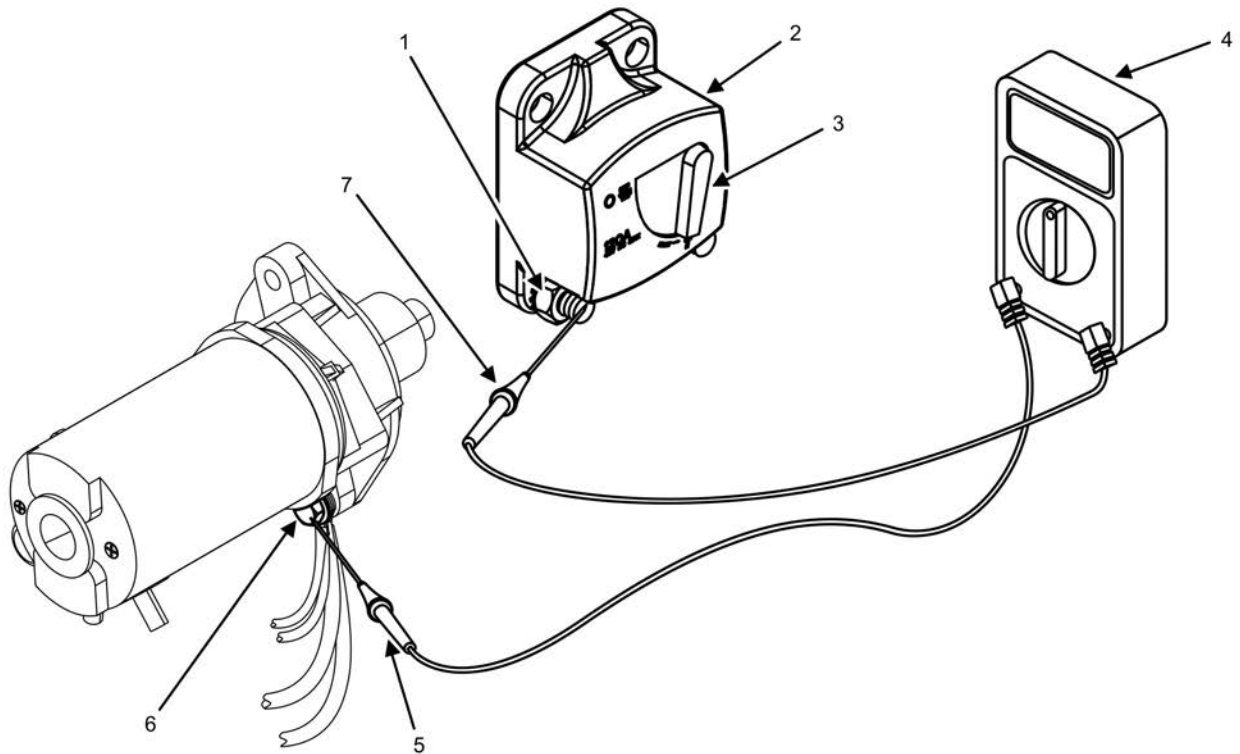
**Figure 3. Test Main DC Circuit Breaker — Continuity.**

2. Test main DC circuit breaker (Figure 2, Item 3) for proper continuity:

#### NOTE

Any multimeter reading greater than approximately 1  $\Omega$  continuity test indicates the main DC circuit breaker is faulty and should be replaced. If main DC circuit breaker fails the continuity test, a short-to-ground test (see step 3) is not necessary.

- a. Set multimeter (Figure 3, Item 4) to ohms ( $\Omega$ ) and verify that multimeter is operating correctly by touching meter probes together and observing a reading of less than approximately 1  $\Omega$  on multimeter.
- b. Set main DC circuit breaker switch (Figure 3, Item 3) to ON position.
- c. Place one probe (Figure 3, Item 5) on each main DC circuit breaker terminal (Figure 3, Item 1) and verify multimeter reading is no greater than approximately 1  $\Omega$ .
- d. Replace main DC circuit breaker (Figure 3, Item 2) if multimeter reading is greater than approximately 1  $\Omega$  when main DC circuit breaker terminals (Figure 3, Item 1) are tested.



**Figure 4. Test Main DC Circuit Breaker — Ground.**

### NOTE

A short-to-ground test is not necessary if the main DC circuit breaker (Figure 4, Item 2) failed the continuity test in Step 2.

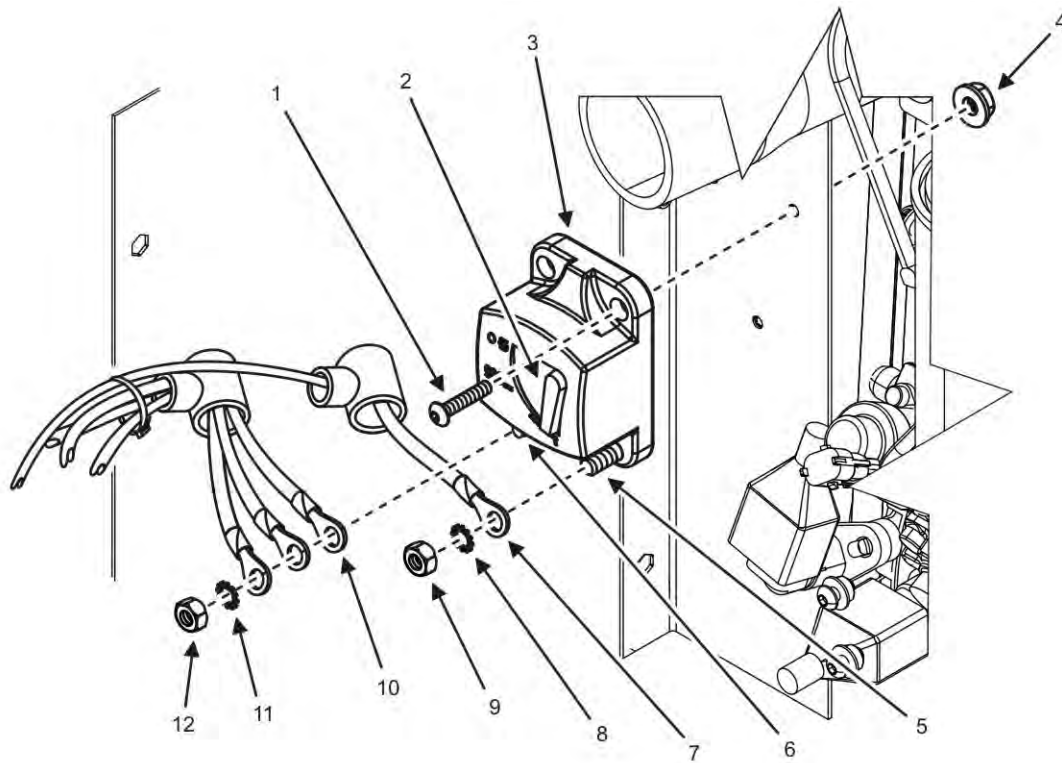
The main DC circuit breaker must be installed when testing for short to ground.

3. Test main DC circuit breaker (Figure 4, Item 2) for short-to-ground:
  - a. Set multimeter (Figure 4, Item 4) to ohms ( $\Omega$ ).
  - b. Set main DC circuit breaker switch (Figure 4, Item 3) to ON position.
  - c. Place one multimeter probe (Figure 4, Item 7) on starter negative terminal (Figure 4, Item 6) and one probe (Figure 4, Item 5) on either of the two main DC circuit breaker terminals (Figure 4, Item 1).
  - d. Replace main DC circuit breaker (Figure 4, Item 2) if multimeter reading is less than 1 megohm ( $M\Omega$ ).

### END OF TASK

#### Install Main DC Circuit Breaker

1. Perform Step 2 of Test Main DC Circuit Breaker task for continuity prior to installation of a new circuit breaker.
2. Set main DC circuit breaker switch (Figure 5, Item 2) to OFF/TRIP position.
3. Position main DC circuit breaker (Figure 5, Item 3) at mounting location on belt guard.
4. Secure main DC circuit breaker (Figure 5, Item 3) to belt guard using three socket head screws (Figure 5, Item 1) and three flange nuts (Figure 5, Item 4).



**Figure 5. Main DC Circuit Breaker — Installation.**

5. Install wires (Figure 5, Item 10) to load (left-side) terminal (Figure 5, Item 6) as indicated by wiring tags, using lock washer (Figure 5, Item 11) and nut (Figure 5, Item 12) to secure wires (Figure 5, Item 10) to load (left-side) terminal (Figure 5, Item 6).
6. Install wire (Figure 5, Item 7) to line (right-side) circuit breaker terminal (Figure 5, Item 5) as indicated by wiring tags, using lock washer (Figure 5, Item 8) and nut (Figure 5, Item 9) to secure wire (Figure 5, Item 7) to line (right-side) terminal (Figure 5, Item 5).
7. Place protective caps over all main DC circuit breaker wires (Figure 5, Items 7 and 10) and terminals (Figure 5, Items 5 and 6).
8. Verify three socket head screws (Figure 5, Item 1) and three flange nuts (Figure 5, Item 4) are fully secured.
9. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
10. Install access panel (WP 0030, Remove/Install Front Body Panel).
11. Set main DC circuit breaker switch to ON position.
12. Close left-side door.
13. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
14. Start engine and check for proper operation (TM 9-6115-752-10).
15. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL INTAKE AIR HEATER RELAY**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Switch, relay, electromagnetic (WP 0107, Repair Parts List, Figure 2, Item 21)

Tag, marker (WP 0180, Expendable and Durable Items List, Item 37)

**Personnel Required**

91D (1)

**References**

WP 0100, General Maintenance

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**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Fuel filter/water separator removed (WP 0047, Remove/Install Fuel Filter/Water Separator Assembly)

**REMOVE/INSTALL INTAKE AIR HEATER RELAY****Remove Intake Air Heater Relay**

1. Ensure equipment conditions are met in the order presented in initial setup.
2. Open left-side door and locate intake air heater relay (Figure 1) mount on the unit bulkhead panel.

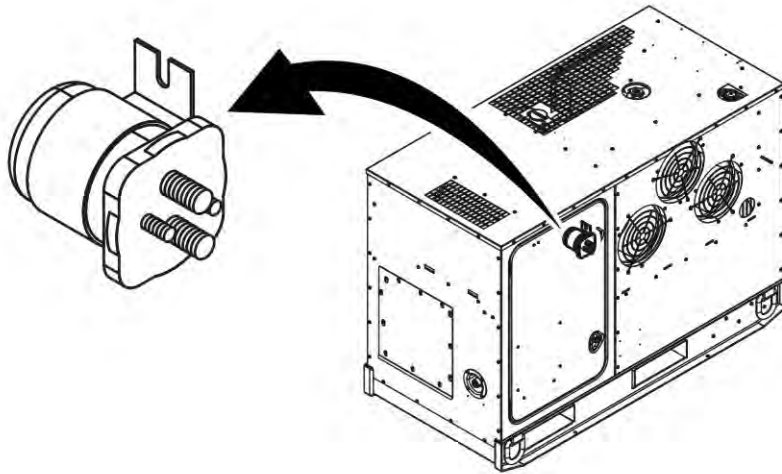
**NOTE**

Four electrical wires (two large and two small) are attached to the intake air heater relay (Figure 2, Item 2). For clarity, only one wire of each size is shown in Figure 2. All four electrical wires are removed using the same procedure.

Prior to removal, tag/mark all four electrical wires and the four terminal posts on the intake air heater relay (Figure 2, Item 2). Tags/markings will be used as a guide at installation.

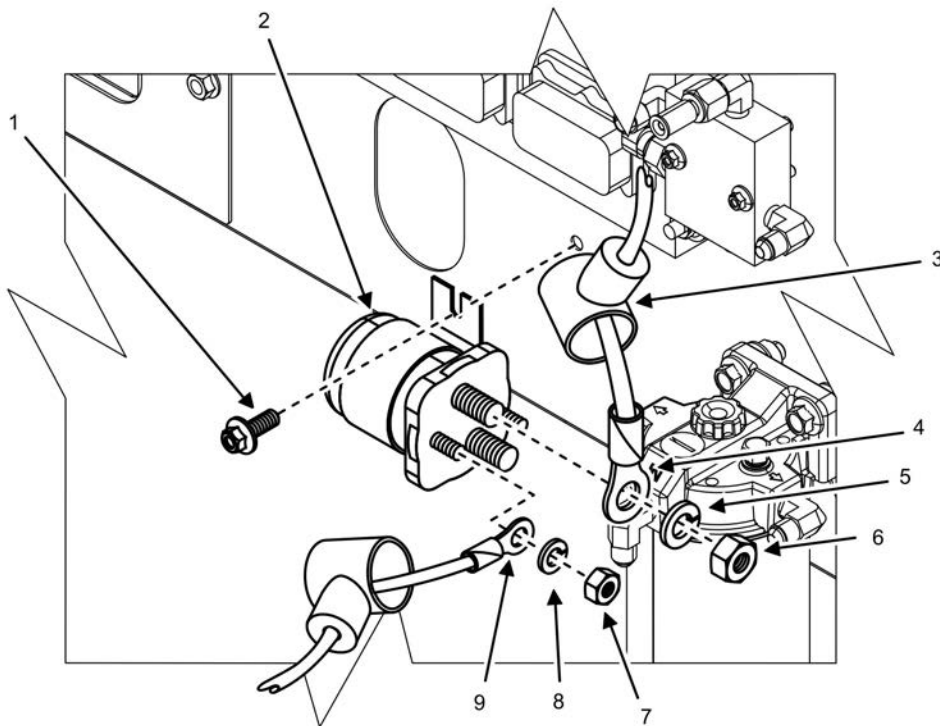
3. Remove two screws (Figure 2, Item 1) that secure intake air heater relay (Figure 2, Item 2) to unit bulkhead panel of generator set.
4. Remove intake air heater relay (Figure 2, Item 2) from mounting location.
5. Tag/mark four electrical wires attached to the four terminal posts of intake air heater relay (Figure 2, Item 2).
6. Reposition boot (Figure 2, Item 3) on large electrical wire (Figure 2, Item 4) to expose nut (Figure 2, Item 6).
7. Remove nut (Figure 2, Item 6) and lock washer (Figure 2, Item 5) that secure large electrical wire (Figure 2, Item 4) to intake air heater relay (Figure 2, Item 2) terminal post.
8. Remove large electrical wire (Figure 2, Item 4) from intake air heater relay (Figure 2, Item 2) terminal post.

9. Repeat steps 6 through 8 for remaining large electrical wire.



**Figure 1. Intake Air Heater Relay — Location.**

10. Reposition boot (Figure 2, Item 3) on small electrical wire (Figure 2, Item 9) to expose nut (Figure 2, Item 7).
11. Remove nut (Figure 2, Item 7) and lock washer (Figure 2, Item 8) that secure small electrical wire (Figure 2, Item 9) to intake air heater relay (Figure 2, Item 2) terminal post.



**Figure 2. Intake Air Heater Relay — Removal.**

12. Remove small electrical wire (Figure 2, Item 9) from intake air heater relay (Figure 2, Item 2) terminal post.

13. Repeat steps 10 through 12 for remaining small electrical wire.

## END OF TASK

### Inspect Intake Air Heater Relay

1. Inspect intake air heater relay (Figure 2, Item 2) for signs of obvious damage.
2. Replace damaged intake air heater relay (Figure 2, Item 2).
3. Inspect four electrical wires (Figure 2, Items 4 and 9) for signs of obvious damage.
4. Replace damaged electrical wires (WP 0100, General Maintenance).

## END OF TASK

### Install Intake Air Heater Relay

## NOTE

Four electrical wires (two large and two small) are attached to the intake air heater relay (Figure 2, Item 2). For clarity, only one wire of each size is shown in Figure 2. All four electrical wires are installed using the same procedure.

Tags/markings applied to electrical wires during removal should be used as guides during installation. Do not remove any temporary identification tags/markings until installation is complete and equipment is operating properly.

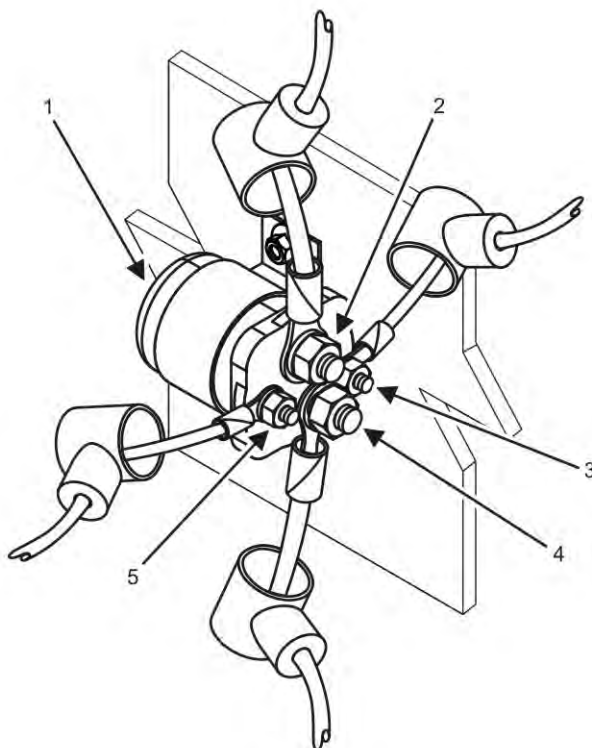
1. Install small electrical wire (Figure 2, Item 9) to intake air heater relay (Figure 2, Item 2) using tags/markings applied during removal as a guide.
2. Secure small electrical wire (Figure 2, Item 9) to intake air heater relay (Figure 2, Item 2) by installing nut (Figure 2, Item 7) and lock washer (Figure 2, Item 8).
3. Repeat steps 1 and 2 for remaining small electrical wire.
4. Install large electrical wire (Figure 2, Item 4) to intake air heater relay (Figure 2, Item 2) using tags/markings applied during removal as a guide.
5. Secure large electrical wire (Figure 2, Item 4) to intake air heater relay (Figure 2, Item 2) by installing nut (Figure 2, Item 6) and lock washer (Figure 2, Item 5).
6. Repeat steps 4 and 5 for remaining large electrical wire.
7. Position protective boots (Figure 2, Item 3) to protect all four electrical connections at intake air heater relay (Figure 2, Item 2).
8. Position intake air heater relay (Figure 2, Item 2) to its mounting position on unit bulkhead panel and align the mounting holes.
9. Secure intake air heater relay (Figure 2, Item 2) to unit bulkhead panel by installing two screws (Figure 2, Item 1).
10. Install fuel filter/water separator (Remove/Install Fuel Filter/Water Separator Assembly).
11. Close left-side door.
12. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
13. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
14. Start engine and check for proper operation (TM 9-6115-752-10).

15. Repair as required.

## END OF TASK

### Test Intake Air Heater Relay

1. Ensure engine control switch is OFF and engine is cool (TM 9-6115-752-10).
2. Remove battery ground cable (WP 0037, Remove/Install Batteries).



**Figure 3. Intake Air Heater Relay — Test.**

3. Use a multimeter set to test  $\Omega$  (WP 0100, General Maintenance) to check intake air heater relay (Figure 3, Item 1) coil for proper resistance between P2-b terminal (Figure 3, Item 5) and P2-E terminal (Figure 3, Item 3).

## NOTE

Intake air heater relay (Figure 3, Item 1) resistance should be approximately 82 86 - 84  $\Omega$  at 77°F (25°C).

4. Replace intake air heater relay (Figure 3, Item 1) if coil is open (greater than 100,000  $\Omega$ ) or shorted (less than 10  $\Omega$ ). See Remove Intake Air Heater Relay task.
5. Use a multimeter set to test continuity (WP 0100, General Maintenance) to check for continuity between K18-1 CB201-LOAD terminal (Figure 3, Item 4) and HTR 1 (+) terminal (Figure 3, Item 2) of intake air heater relay (Figure 3, Item 1).
6. Replace intake air heater relay (Figure 3, Item 1) if continuity is found between K18-1 CB201-LOAD terminal (Figure 3, Item 4) and HTR 1 (+) terminal (Figure 3, Item 2). See Remove Intake Air Heater Relay task.

7. Install battery ground cable (WP 0037, Remove/Install Batteries).

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL NATO SLAVE RECEPTACLE**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Connector, receptacle (WP 0107, Repair Parts List, Figure 2, Item 17)

Strap, tie-down (WP 0180, Expendable and Durable Items List, Item 36)

**Personnel Required**

91D (1)

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

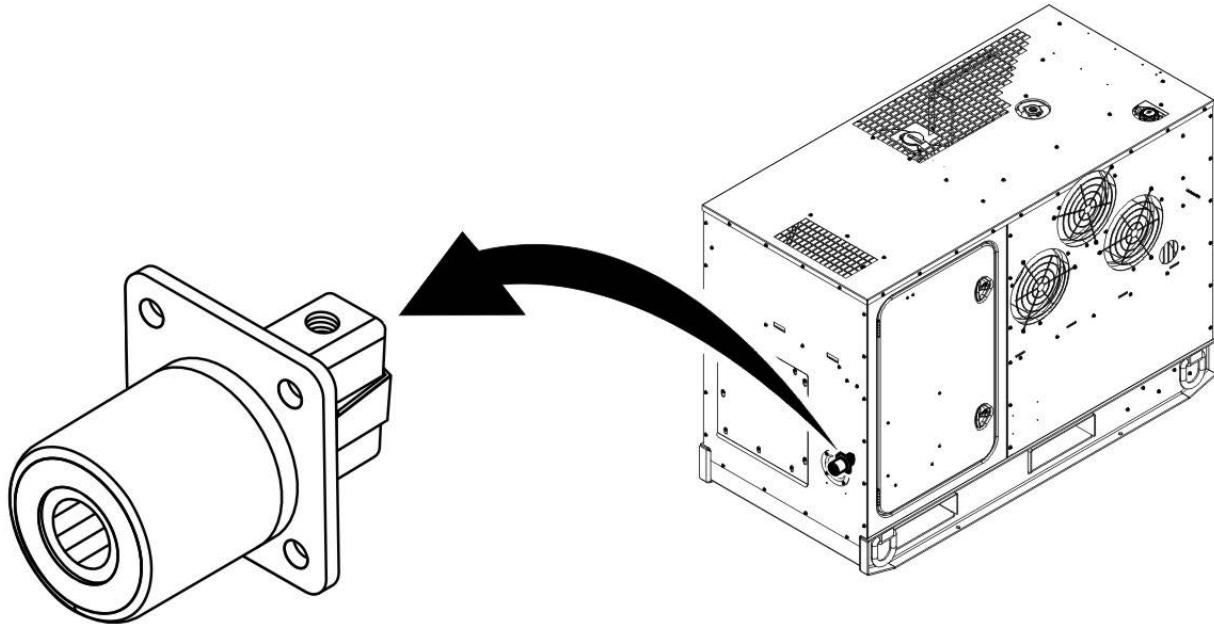
Cable from negative battery terminal of right-hand battery disconnected (WP 0037, Remove/Install Batteries)

Cable from negative battery terminal of left-hand battery disconnected (WP 0037, Remove/Install Batteries)

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**REMOVE/INSTALL NATO SLAVE RECEPTACLE****WARNING**

- The NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.
- The right-hand battery negative lead that connects directly to the grounding stud must be disconnected prior to disconnecting or removing batteries. Follow procedural steps in exact order given for removal or installation. Failure to comply may cause injury or death to personnel.

**Remove NATO Slave Receptacle****Figure 1. NATO Slave Receptacle — Location.**

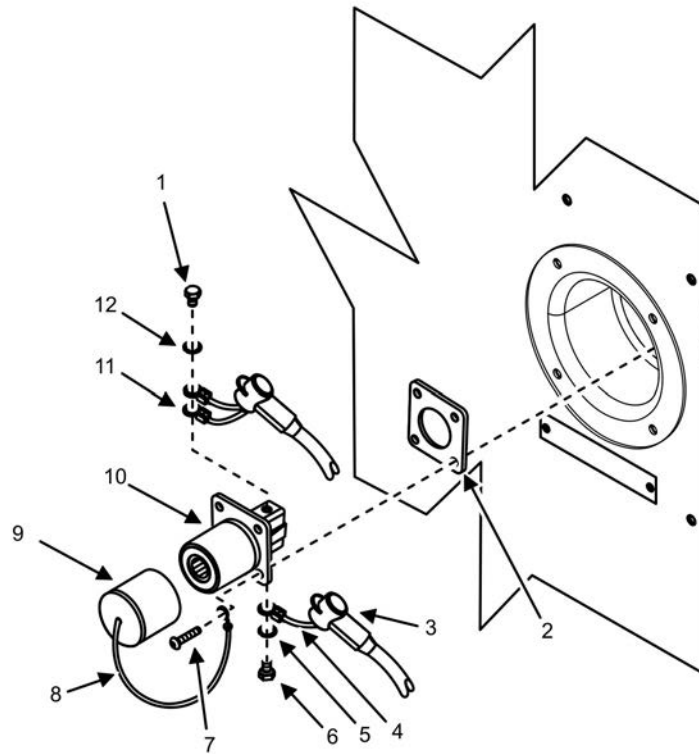
1. Open right-side door on generator set to locate NATO slave receptacle (Figure 1) and batteries.

**NOTE**

Before removing the NATO slave receptacle, take note of the orientation of positive (+) and negative (-) connections of the receptacle. Positive (+) and negative (-) symbols are stamped on the NATO slave receptacle terminal ends.

2. Re-position boot (Figure 2, Item 3), remove bolt (Figure 2, Item 6), lock washer (Figure 2, Item 5), and ground cable (Figure 2, Item 4) from negative side of NATO slave receptacle (Figure 2, Item 10).
3. Tag and identify ground cable (Figure 2, Item 4) for installation purposes.
4. Re-position boot (Figure 2, Item 3) and remove bolt (Figure 2, Item 1), lock washer (Figure 2, Item 12), and two power cables (Figure 2, Item 11) from positive side of NATO slave receptacle (Figure 2, Item 10).
5. Tag and identify power cables (Figure 2, Item 11) for installation purposes.





**Figure 2. NATO Slave Receptacle — Detail.**

6. Discard lock washers (Figure 2, Items 5 and 12).
7. Remove four bolts (Figure 2, Item 7), NATO slave receptacle (Figure 2, Item 10), gasket (Figure 2, Item 2), protective cap (Figure 2, Item 9), and tether (Figure 2, Item 8) from front body panel of unit. Discard gasket (Figure 2, Item 2).

## **END OF TASK**

### **Inspect NATO Slave Receptacle**

1. Inspect NATO slave receptacle (Figure 2, Item 10), protective cap (Figure 2, Item 9), and tether (Figure 2, Item 8) for obvious signs of damage, corrosion, or burning.
2. Replace NATO slave receptacle (Figure 2, Item 10), protective cap (Figure 2, Item 9), and tether (Figure 2, Item 8) as required.
3. Inspect power and ground cables (Figure 2, Items 11 and 4) and cable ends for signs of damage. Repair or replace as required.
4. Inspect boots (Figure 2, Item 3) on positive and negative cables (Figure 2, Items 11 and 4) and replace if damaged.

## **END OF TASK**

### **Install NATO Slave Receptacle**

1. Install new gasket (Figure 2, Item 2) onto terminal end of NATO slave receptacle (Figure 2, Item 10) and align mounting holes.

**NOTE**

For easier tool access during installation, the NATO slave receptacle (Figure 2, Item 10) can be installed with the terminals one above the other, rather than side by side.

2. Position and insert terminal end of NATO slave receptacle (Figure 2, Item 10) through mounting location on front of unit and align mounting holes.

**NOTE**

Tether (Figure 2, Item 8) is attached to lower right-hand mounting bolt (Figure 2, Item 7).

3. Position NATO slave receptacle (Figure 2, Item 10) to front of unit by installing four bolts (Figure 2, Item 7).

**CAUTION**

Negative (-) and positive (+) symbols are stamped on the NATO slave receptacle terminal ends. Ensure positive (+) and negative (-) cables are attached to the correct terminal ends. Failure to comply may cause damage to equipment.

4. Position two power cables (Figure 2, Item 11) onto positive side of NATO slave receptacle (Figure 2, Item 10). Refer to cable tags installed during disassembly.
5. Secure two power cables (Figure 2, Item 11) to positive side of NATO slave receptacle (Figure 2, Item 10) using mounting bolt (Figure 2, Item 1) and new lock washer (Figure 2, Item 12).
6. Cover mounting bolt (Figure 2, Item 1) and new lock washer (Figure 2, Item 12) of power cables (Figure 2, Item 11) with boot (Figure 2, Item 3).

**CAUTION**

Negative (-) and positive (+) symbols are stamped on the NATO slave receptacle terminal ends. Ensure positive (+) and negative (-) cables are attached to the correct terminal ends. Failure to comply may cause damage to equipment.

7. Position ground cable (Figure 2, Item 4) onto negative side of NATO slave receptacle (Figure 2, Item 10).
8. Secure ground cable (Figure 2, Item 4) to negative side of NATO slave receptacle (Figure 2, Item 10) using bolt (Figure 2, Item 6) and new lock washer (Figure 2, Item 5).
9. Cover mounting bolt (Figure 2, Item 6) and new lock washer (Figure 2, Item 5) with boot (Figure 2, Item 3).
10. Install protective cap (Figure 2, Item 9) on exterior of NATO slave receptacle (Figure 2, Item 10).
11. Connect cable to negative battery terminal of left-hand battery (WP 0037, Remove/Install Batteries).
12. Connect ground cable to negative battery terminal of right-hand battery (WP 0037, Remove/Install Batteries).
13. Close right-side door.
14. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
15. Start engine and check for proper operation (TM 9-6115-752-10).
16. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**SERVICE FUEL SYSTEM**

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**INITIAL SETUP:****Test Equipment**

Beaker, Laboratory (WP 0179, Table 2, Item 3)

**Tools and Special Tools**

Adapter, Socket Wrench Drive 1/2" Male – 3/8" Female (WP 0179, Table 2, Item 32)

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0179, Table 2, Item 39)

**Materials/Parts**

Cap set, protective (WP 0180, Expendable and Durable Items List, Item 8)

Detergent, general purpose (WP 0180, Item 18)

Fuel, diesel (WP 0180, Item 21)

Grease, electrically conductive (WP 0180, Item 22)

Pan, drain (WP 0180, Item 30)

Rag, wiping (4) (WP 0180, Item 33)

**Personnel Required**

91D (1)

Assistant (1)

**References**

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

WP 0037, Remove/Install Batteries

WP 0039, Remove/Install Engine Wiring Harness

WP 0045, Remove/Install Fuel Pump, Main/Auxiliary

WP 0046, Remove/Install Fuel Manifold

WP 0047, Remove/Install Fuel Filter/Water Separator Assembly

WP 0048, Replace Fuel Filter/Water Separator Element

WP 0100, General Maintenance

Foldout Pages

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

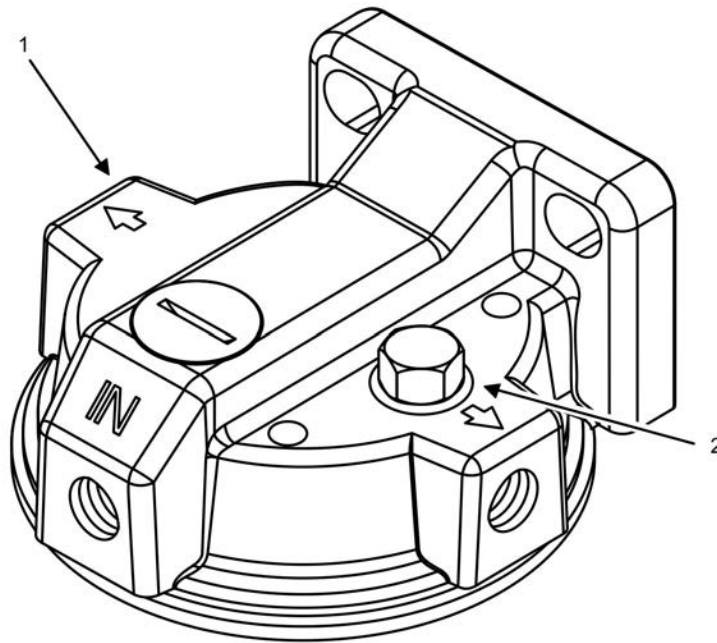
Engine cool

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**SERVICE FUEL SYSTEM****WARNING**

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.
- Make sure engine control switch is only set to PRIME & RUN during fuel system checks. Failure to comply may cause injury or death to personnel.

## Purge Fuel Lines



**Figure 1. Air Bleed Vent Plug.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door.
3. Locate air bleed vent plug (Figure 1, Item 2) on fuel filter/water separator head (Figure 1, Item 1).
4. Place suitable container and wiping rags under and around air bleed vent plug (Figure 1, Item 2).
5. Remove dirt and debris on fuel filter/water separator head (Figure 1, Item 1) to prevent contamination of fuel system.

### NOTE

Capture spilled fuel and dispose of IAW local SOP.

6. Remove air bleed vent plug (Figure 1, Item 2) from fuel filter/water separator head (Figure 1, Item 1).

### NOTE

The use of an assistant is required for the following procedure.

7. Turn engine control switch to PRIME & RUN (using assistant) to pump fuel (TM 9-6115-752-10).
8. Observe fuel flow for evidence of air in the fuel line as indicated by bubbles, frothy appearance, or breaks in flow.
9. Turn engine control switch to OFF (using assistant) when evidence of air in fuel no longer appears for 2 – 3 sec (TM 9-6115-752-10).
10. Install air bleed vent plug (Figure 1, Item 2) to fuel filter/water separator head (Figure 1, Item 1).
11. Close left-side door.

12. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
13. Start engine and check for leaks and proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
14. Repeat steps 1 through 13 if engine stops.
15. Dispose of captured fuel IAW local SOP.

## END OF TASK

### Check Fuel Flow

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open rear panel door.
3. Check fuel level. Add fuel to fuel tank if empty. See Fill Fuel Tank task.
4. Purge fuel lines. See Purge Fuel Lines task.
5. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10) and listen to confirm fuel pump operation.
6. Continue to step 13 if fuel pump activates.
7. Ensure electrical connector is attached to main fuel pump if fuel pump does not activate (WP 0045, Remove/Install Fuel Pump, Main/Auxiliary).

## WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

8. Disconnect main fuel pump connector (P65) and use a multimeter set to test VDC to check electrical connector pins for 24 VDC  $\pm 10\%$  if electrical connector is attached but main fuel pump is not operating (WP 0100, General Maintenance).
9. Replace main fuel pump if voltage is within 24 VDC  $\pm 10\%$  range (WP 0045, Remove/Install Fuel Pump, Main/Auxiliary).
10. Use wiring diagrams and troubleshoot electrical wires P2-N and P2-V for opens or shorts if voltage is outside 24 VDC  $\pm 10\%$  range (Foldout Pages).
11. Repair or replace wiring if a short or open is found (WP 0100, General Maintenance and WP 0039, Remove/Install Engine Wiring Harness).
12. Test and replace DCS as required if no short or open is found (WP 0018, Repair DCS and WP 0017, Remove/Install DCS).
13. Turn engine control switch to OFF (TM 9-6115-752-10).
14. Open left-side door.
15. Remove fuel supply engine hose at engine (WP 0047, Remove/Install Fuel Filter/Water Separator Assembly).
16. Place open end of fuel supply engine hose into suitable container of at least 16 oz (500 mL) to catch pumped fuel.

## NOTE

The use of an assistant is required for the following procedure.

17. Turn engine control switch to PRIME & RUN (using assistant) for approximately 15 sec to pump fuel through fuel supply engine hose (TM 9-6115-752-10).

18. Turn engine control switch to OFF (TM 9-6115-752-10).
  - a. Install fuel supply engine hose and proceed to step 26 if fuel flow volume is approximately 12 oz (355 mL) after 15 sec (WP 0047, Remove/Install Fuel Filter/Water Separator Assembly).
  - b. Install fuel supply engine hose and remove fuel supply line from IN port of fuel filter/water separator if no fuel exits fuel supply hose or volume is less than approximate value in step a (WP 0047, Remove/Install Fuel Filter/Water Separator Assembly).
19. Place open end of fuel supply line into suitable container to catch pumped fuel.
20. Turn engine control switch to PRIME & RUN (using assistant) for approximately 15 sec to pump fuel through fuel supply line (TM 9-6115-752-10).
21. Turn engine control switch to OFF (TM 9-6115-752-10).
  - a. If fuel flow volume is approximately 12 oz (355 mL) after 15 sec, replace fuel filter/water separator element, install fuel supply line, and proceed to step 26 (WP 0048, Remove/Install Fuel Filter/Water Separator Element).
  - b. If no fuel exits fuel supply line or volume is less than specification when engine control switch is turned to PRIME & RUN, service strainers in fuel manifold. See Service Fuel Strainers task.
22. Turn engine control switch to PRIME & RUN (using assistant) for approximately 15 sec to pump fuel through fuel supply line again (TM 9-6115-752-10).
23. Turn engine control switch to OFF (TM 9-6115-752-10).
  - a. Install fuel supply line and proceed to step 26 if fuel flow volume is approximately 12 oz (355 mL) after 15 sec (WP 0047, Remove/Install Fuel Filter/Water Separator Assembly).
  - b. If no fuel exits fuel supply line at fuel filter/water separator or volume is less than specification when engine control switch is turned to PRIME & RUN, inspect fuel manifold fuel pickup tube for signs of damage or restriction. Replace or repair as required (WP 0046, Remove/Install Fuel Manifold).
24. Turn engine control switch to PRIME & RUN (using assistant) for approximately 15 sec to pump fuel through fuel supply line again (TM 9-6115-752-10).
25. Turn engine control switch to OFF (TM 9-6115-752-10).
  - a. Install fuel supply line and proceed to step 26 if fuel flow volume is approximately 12 oz (355 mL) after 15 sec (WP 0047, Remove/Install Fuel Filter/Water Separator Assembly).
  - b. If no fuel exits fuel supply line at fuel filter/water separator or volume is less than specification when engine control switch is turned to PRIME & RUN, install fuel supply line, replace main fuel pump, and proceed to step 26 (WP 0045, Remove/Install Fuel Pump, Main/Auxiliary and WP 0047, Remove/Install Fuel Filter/Water Separator Assembly).

## NOTE

Wipe down fuel lines, parts, and fittings with wiping rag prior to installation.

26. Close rear and left-side doors.
27. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
28. Start engine and check for leaks and proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
29. Repeat steps 1 through 28 if engine stops.
30. Dispose of captured fuel IAW local SOP.

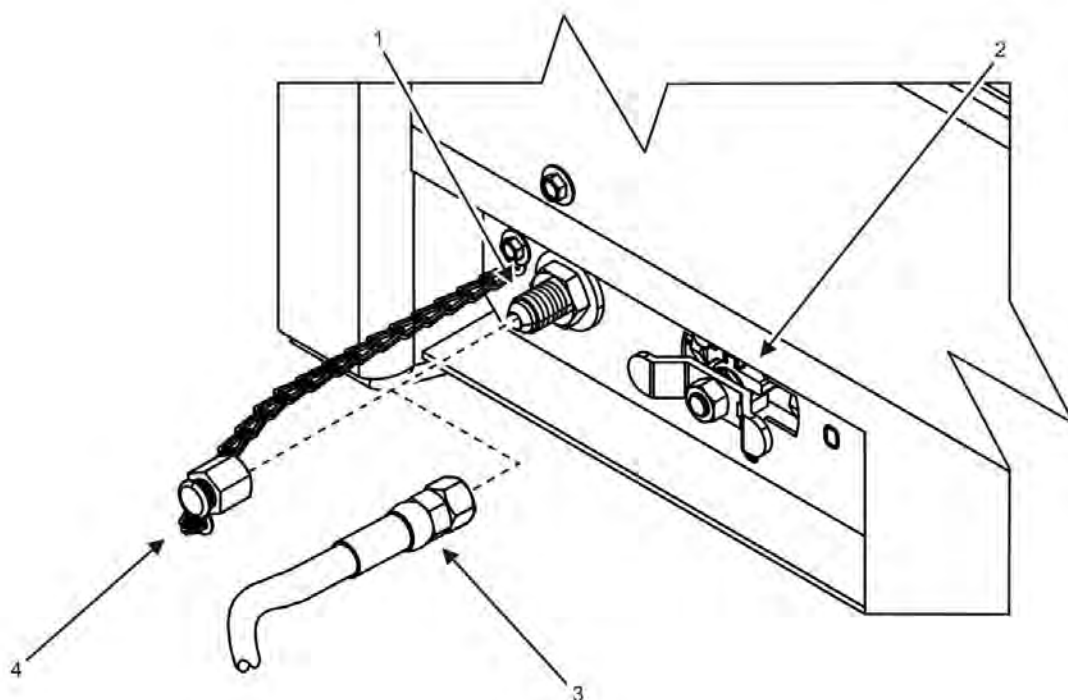
## END OF TASK

## Drain Fuel Tank

### NOTE

Capture spilled fuel and dispose of IAW local SOP.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove any dirt and debris around fuel drain outlet cap (Figure 2, Item 4).
3. Place drain pan under fuel drain outlet bulkhead connector (Figure 2, Item 1) to catch drained fuel.
4. Remove fuel drain outlet cap (Figure 2, Item 4) from fuel drain outlet bulkhead connector (Figure 2, Item 1).
5. Obtain auxiliary fuel line (Figure 2, Item 3) from accessory box on rear of right-side access door.
6. Connect auxiliary fuel line (Figure 2, Item 3) to fuel drain outlet bulkhead connector (Figure 2, Item 1).
7. Remove fuel filler cap (Figure 3, Item 2) from filler neck (Figure 3, Item 1).
8. Open ball valve (Figure 2, Item 2) by rotating lever counter-clockwise to the open position.



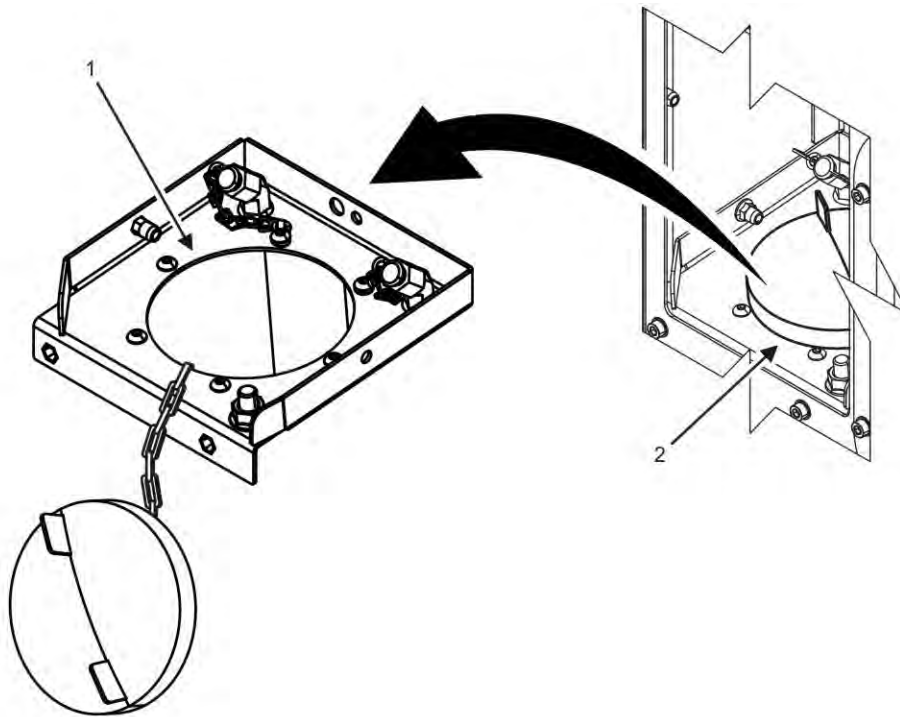
**Figure 2. Fuel Drain — Detail.**

9. Close ball valve (Figure 2, Item 2) when flow of fuel stops by rotating lever clockwise to the shut position.
10. Remove auxiliary fuel line (Figure 2, Item 3) from fuel drain outlet bulkhead connector (Figure 2, Item 1) and ensure auxiliary fuel line (Figure 2, Item 3) is drained IAW local SOP.
11. Replace fuel drain outlet cap (Figure 2, Item 4) on fuel drain outlet bulkhead connector (Figure 2, Item 1).

12. Wipe down auxiliary fuel line (Figure 2, Item 3) and store it in accessory box on rear of right-side access door.
13. Clean fuel drain outlet area of fuel and dirt.
14. Dispose of soiled rags IAW local SOP.
15. Replace fuel filler cap (Figure 3, Item 2) and tighten.

## END OF TASK

### Fill Fuel Tank



**Figure 3. Fuel Filler — Location.**

## WARNING

Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (fuel fill static ground). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate ESD. Failure to comply may cause injury or death to personnel.

## NOTE

Note orientation of fuel cap before removal to aid in installation.

1. Remove negative ground cable from right-hand battery (WP 0037, Remove/Install Batteries).

## NOTE

Capture and dispose of spilled fluid IAW local SOP.

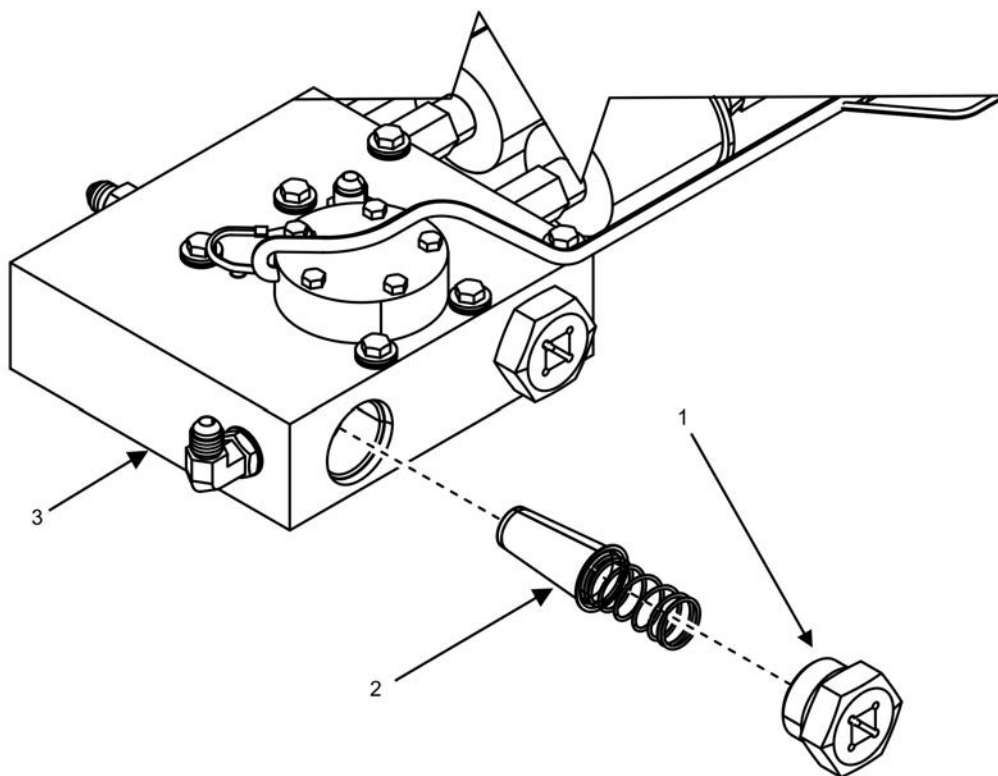
2. Remove fuel filler cap (Figure 3, Item 2).



3. Ensure ball valve (Figure 2, Item 2) is securely closed and 90 degrees from direction of fuel flow.
4. Add approved fuel into fuel filler opening (Figure 3, Item 1) until the level of fuel is at the top of the fuel tank.
5. Replace fuel filler cap (Figure 3, Item 2) and secure.
6. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).

## END OF TASK

### Service Fuel Strainers



**Figure 4. Fuel Strainer — Detail.**

1. Open right-side door.
2. Remove negative ground cable from right-hand battery (WP 0037, Remove/Install Batteries).
3. Open rear door and locate fuel strainer plugs (Figure 4, Item 1) on fuel manifold (Figure 4, Item 4).
4. Remove fuel strainer plugs (Figure 4, Item 1) from fuel manifold (Figure 4, Item 4).
5. Remove strainers (Figure 4, Item 2) from fuel manifold (Figure 4, Item 3).
6. Remove any dirt, debris, or blockages and clean strainers (Figure 4, Item 2) with detergent.
7. Inspect strainers (Figure 4, Item 2) for holes, tears, and other signs of obvious damage. Replace as required.
8. Install strainers (Figure 4, Item 2) to fuel manifold (Figure 4, Item 3).

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**NOTE**

Wipe down fuel lines, parts, and fittings with wiping rag prior to installation.

9. Use a 3/8-in female to 1/2-in male adapter and install and install fuel strainer plugs (Figure 4, Item 1) to a torque value of 18 – 22 ft/lb (24 – 30 Nm).
10. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
11. Close generator set doors.

**CAUTION**

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

12. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
13. Start engine and check for leaks and proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
14. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL FUEL PUMP, MAIN/AUXILIARY**

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**INITIAL SETUP****Tools and Special Tools**

Crowfoot Attachment Set, Socket Wrench, Flare Nut, Standard (WP 0179, Table 2, Item 10)

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0179, Table 2, Item 40)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Pump, fuel, electric (WP 0117, Repair Parts List, Figure 12, Item 11)

Brush, wire, scratch (WP 0180, Expendable and Durable Items List, Item 7)

Cap set, protective (WP 0180, Item 8)

Grease, electrically conductive (WP 0180, Item 22)

Pan, drain (WP 0180, Item 30)

Rag, wiping (4) (WP 0180, Item 33)

Sealant (WP 0180, Item 34)

Tag, marker (WP 0180, Item 37)

**Personnel Required**

91D (1)

**References**

WP 0044, Service Fuel System

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

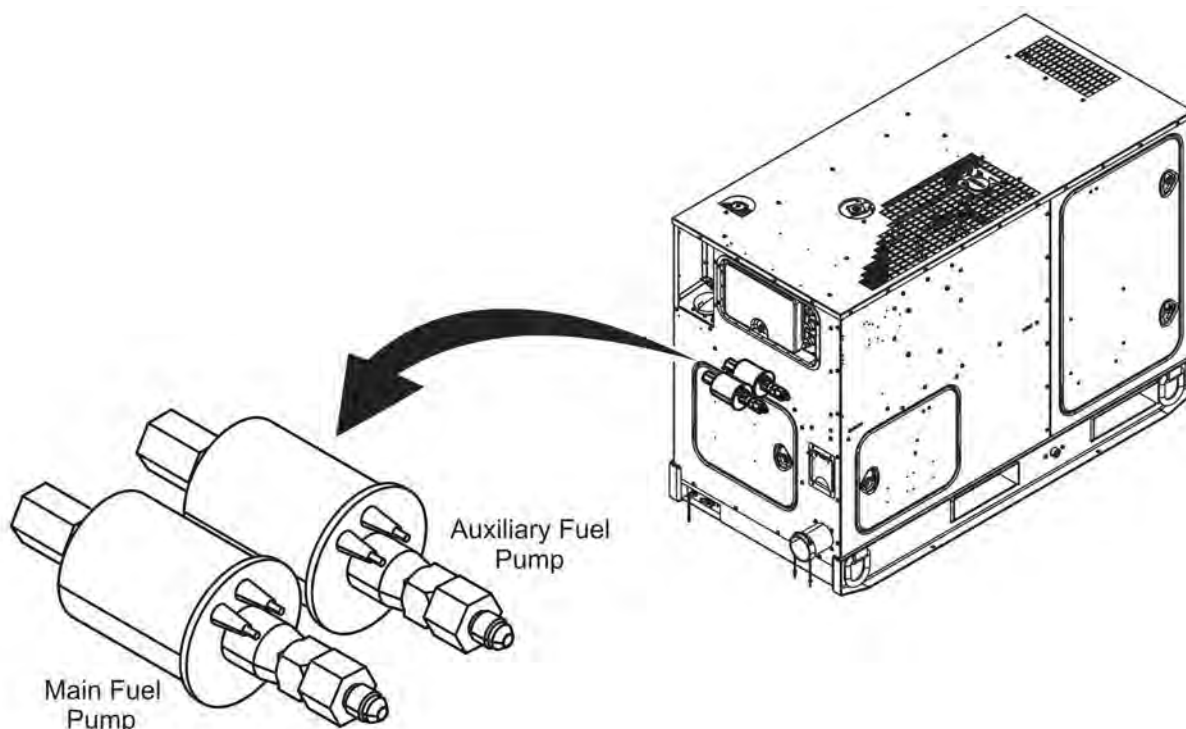
Battery ground cable removed (WP 0037, Remove/Install Batteries)

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**REMOVE/INSTALL FUEL PUMP, MAIN/AUXILIARY****WARNING**

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

## Remove Fuel Pump



**Figure 1. Fuel Pump — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.

### NOTE

Removing the main fuel pump and the auxiliary fuel pump require the same procedure. Fuel supply line connects main fuel pump to fuel filter/water separator. An auxiliary fuel line attaches auxiliary fuel pump to fuel manifold.

2. Locate fuel pump to be removed (Figure 1) through interior panel gap.
3. Tag electrical connectors (Figure 2, Item 2) to facilitate installation if removing both fuel pumps.
4. Disconnect electrical connectors (Figure 2, Item 2) from unit wiring harness connector (Figure 2, Item 3).
5. Inspect electrical connectors (Figure 2, Item 2) for fraying and other signs of obvious damage and replace as required.
6. Open rear panel door.

### NOTE

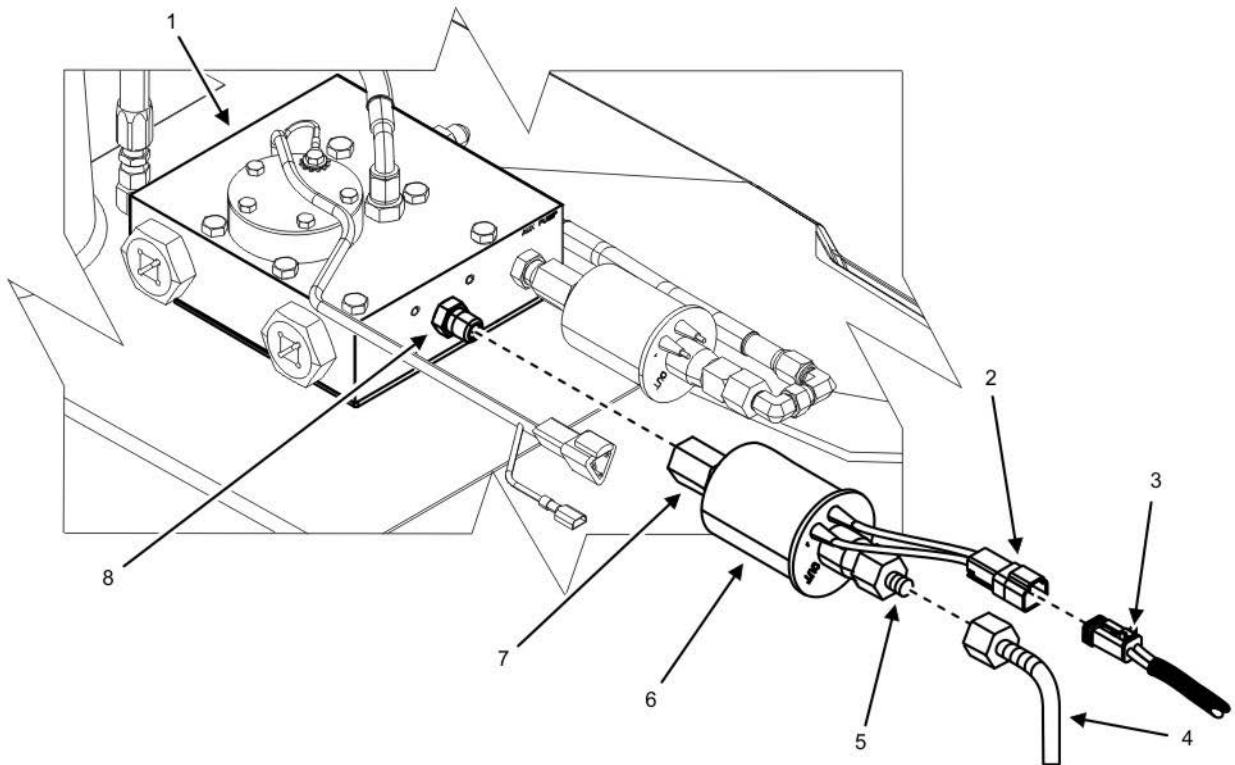
Capture and dispose of spilled fuel IAW local SOP. Cap/plug open fuel lines to prevent dirt and debris from entering the fuel system.

7. Place suitable catch container and wiping rag under fuel pumps (Figure 2, Item 6) to capture spilled fuel.

## NOTE

Two wrenches are required to separate this fitting.

8. Disconnect fitting of fuel supply line (Figure 2, Item 4) from fuel pump male fitting (Figure 2, Item 5). Cap/plug line to prevent dirt and debris from entering the fuel system.
9. Inspect fuel supply line (Figure 2, Item 4) for obvious signs of damage. Replace fuel supply line (Figure 2, Item 4) as required.
10. Loosen fuel pump fitting (Figure 2, Item 7) from fuel manifold connector fitting (Figure 2, Item 8).
11. Remove fuel pump (Figure 2, Item 6) from manifold (Figure 2, Item 1) by turning fuel pump fitting (Figure 2, Item 7) counterclockwise.



**Figure 2. Fuel Pump — Detail.**

12. Place fuel pump (Figure 2, Item 6) on suitable work surface.
13. Remove old sealant from fuel manifold connector fitting (Figure 2, Item 8) and fuel pump male fitting (Figure 2, Item 5) with brush.

## END OF TASK

### Inspect Fuel Pump

1. Inspect fuel pump fitting (Figure 2, Item 7) for cracks and other obvious signs of damage. Replace pump as required.
2. Inspect fuel pump male fitting (Figure 2, Item 5) for cracks and other obvious signs of damage. Replace pump as required.

3. Inspect fuel pump (Figure 2, Item 6) for wear and other signs of obvious damage and replace as required.
4. Inspect fuel manifold connector fitting (Figure 2, Item 8) for signs of obvious damage and replace as required.

**END OF TASK****Install Fuel Pump****CAUTION**

Be sure to install fuel pump (Figure 2, Item 6) in proper direction relative to fuel flow. The flow from this pump is outward. Failure to comply may cause damage to equipment.

**NOTE**

Installing the main fuel pump and the auxiliary fuel pump require the same procedure. Fuel supply line connects main fuel pump to fuel filter/water separator. An auxiliary fuel line attaches auxiliary fuel pump to fuel manifold.

Capture and dispose of spilled fluid IAW local SOP. Remove all caps/plugs from fuel lines/fittings prior to installation of each fuel line.

Wipe down fuel line, pump, and fittings with wiping rag prior to installation.

Sealant cure time is 30 min to use fuel system and 72 hrs for full strength.

1. Apply thread sealant to fuel manifold connector fitting (Figure 2, Item 8) and fuel pump male fitting (Figure 2, Item 5).
2. Position fuel pump (Figure 2, Item 6) to fuel manifold connector fitting (Figure 2, Item 8) and tighten fuel pump fitting (Figure 2, Item 7) one and one-half turns past finger-tight.
3. Position fuel supply line (Figure 2, Item 4) to fuel pump male fitting (Figure 2, Item 5) and finger-tighten fuel pump male fitting (Figure 2, Item 5).
4. Tighten fuel pump male fitting (Figure 2, Item 5) to a torque value of 133 – 142 in/lb (15 – 16 Nm).
5. Remove tags from electrical connectors (Figure 2, Item 2) if necessary.
6. Connect fuel pump electrical connector (Figure 2, Item 2) to unit wiring harness connector (Figure 2, Item 3).
7. Purge fuel system (WP 0044, Service Fuel System).
8. Close generator set doors.
9. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
10. Start engine and check for leaks and proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
11. Repair as required.

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL FUEL MANIFOLD**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Torque Tube, 5-75 FT-LB (WP 0179, Table 2, Item 35)

Torque Wrench Head End, 1/4" X 3/8" Drive, 5/8" (WP 0179, Table 2, Item 36)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0179, Table 2, Item 39)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Gasket (1) (WP 0116, Repair Parts List, Figure 11, Item 41)

Manifold, fuel (1) (WP 0117, Figure 12, Item 20)

Pipe, fuel (1) (WP 0117, Figure 12, Item 17)

Seal, O-ring (WP 0117, Figure 12, Item 2)

Washer, lock 1/4 ext tooth (2) (WP 0117, Figure 12, Item 12)

Washer, sealing (6) (WP 0116, Figure 11, Item 40)

Brush, acid swabbing (WP 0180, Expendable and Durable Items List, Item 5)

Cap set, protective (WP 0180, Item 8)

Cleaning compound, solvent (WP 0180, Item 11)

Compound, sealing (WP 0180, Item 15)

Grease, electrically conductive (WP 0180, Item 22)

Pan, drain (WP 0180, Item 30)

Primer, sealing compound (WP 0180, Item 32)

**Materials/Parts**

Rag, wiping (2) (WP 0180, Item 33)

Sealant (WP 0180, Item 34)

Tag, marker (WP 0180, Item 37)

**Personnel Required**

91D (1)

**References**

WP 0044, Service Fuel System

WP 0045, Remove/Install Fuel Pump, Main/Auxiliary

WP 0051, Remove/Install Fuel Level Sensor

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

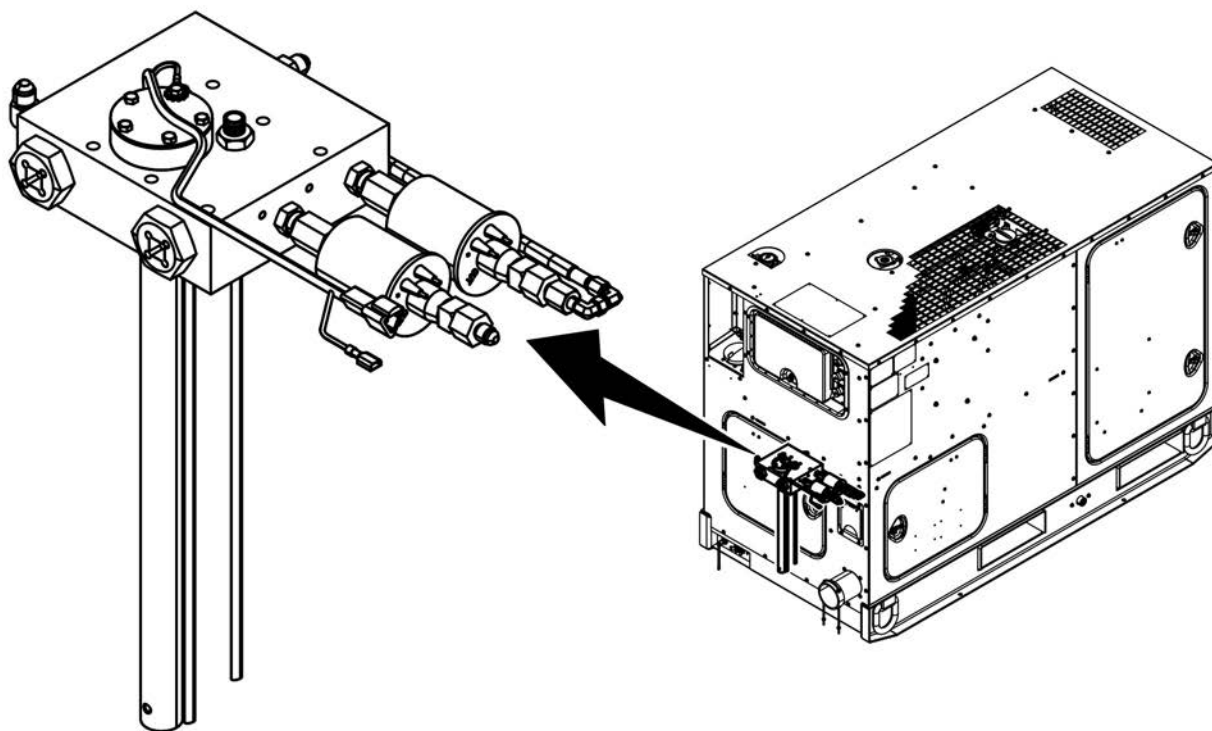
Battery ground cable removed (WP 0037, Remove/Install Batteries)

Relay panel and brackets removed (WP 0038, Remove/Install Relay Panel)

Fuel tank drained to half-capacity (TM 9-6115-752-10)

**REMOVE/INSTALL FUEL MANIFOLD****WARNING**

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

**Remove Fuel Manifold Assembly**

**Figure 1. Fuel Manifold Assembly — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate fuel manifold assembly (Figure 1).
3. Disconnect electrical connectors (Figure 2, Item 12) from engine wiring harness connectors (Figure 2, Item 11).



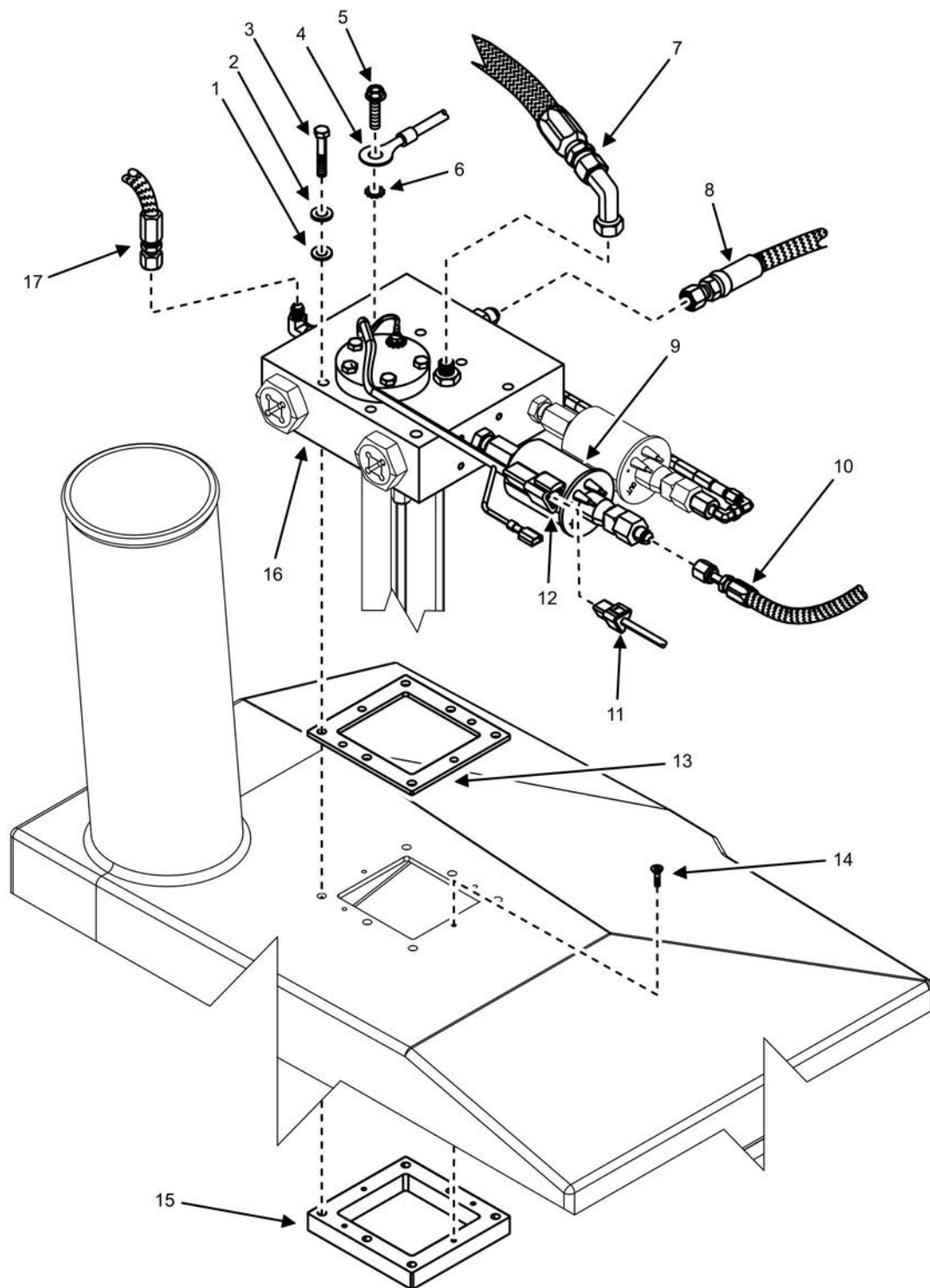


Figure 2. Fuel Manifold Assembly — Removal.

4. Remove screw (Figure 2, Item 5), external tooth lock washer (Figure 2, Item 6), and ground wire (Figure 2, Item 4) from fuel manifold (Figure 3, Item 16).

### NOTE

Capture spilled fuel and dispose of IAW local SOP. Dispose of soiled rags IAW local SOP.

To prevent contamination from entering the fuel system, cap/plug all open fuel lines and fittings.

5. Remove fuel supply line (Figure 2, Item 10) from main fuel pump (Figure 2, Item 9).
6. Place wiping rags around auxiliary fuel intake and vent lines (Figure 2, Items 17 and 7) on fuel manifold assembly (Figure 2, Item 16) to capture spilled fuel when lines are removed.
7. Remove auxiliary fuel intake line (Figure 2, Item 17) from fuel manifold assembly (Figure 2, Item 16).
8. Inspect auxiliary fuel intake line (Figure 2, Item 17) for obvious damage and replace as required.
9. Remove auxiliary fuel vent line (Figure 2, Item 7) from fuel manifold assembly (Figure 2, Item 16).
10. Inspect auxiliary fuel vent line (Figure 2, Item 7) for obvious damage and replace as required.
11. Remove fuel return line (Figure 2, Item 8) from fuel manifold assembly (Figure 2, Item 16).
12. Inspect fuel return line (Figure 2, Item 8) for obvious damage and replace as required.
13. Remove six screws (Figure 2, Item 3), six flat washers (Figure 2, Item 2), and six sealing washers (Figure 2, Item 1) that secure fuel manifold assembly (Figure 2, Item 16) to fuel tank.
14. Discard six sealing washers (Figure 2, Item 1).
15. Remove fuel manifold assembly (Figure 2, Item 16) from fuel tank and place on a suitable work surface.
16. Remove fuel system gasket (Figure 2, Item 13) from fuel tank. Discard fuel system gasket (Figure 2, Item 13).
17. Inspect gasket retainer (Figure 2, Item 15) inside fuel tank for signs of obvious damage. Replace gasket retainer (Figure 2, Item 15) as required.
  - a. Remove two flat screws (Figure 2, Item 14) while supporting gasket retainer (Figure 2, Item 15).
  - b. Tilt and remove gasket retainer (Figure 2, Item 15) through fuel tank opening.
18. Cover hole in fuel tank to prevent dirt and debris from contaminating the fuel system.

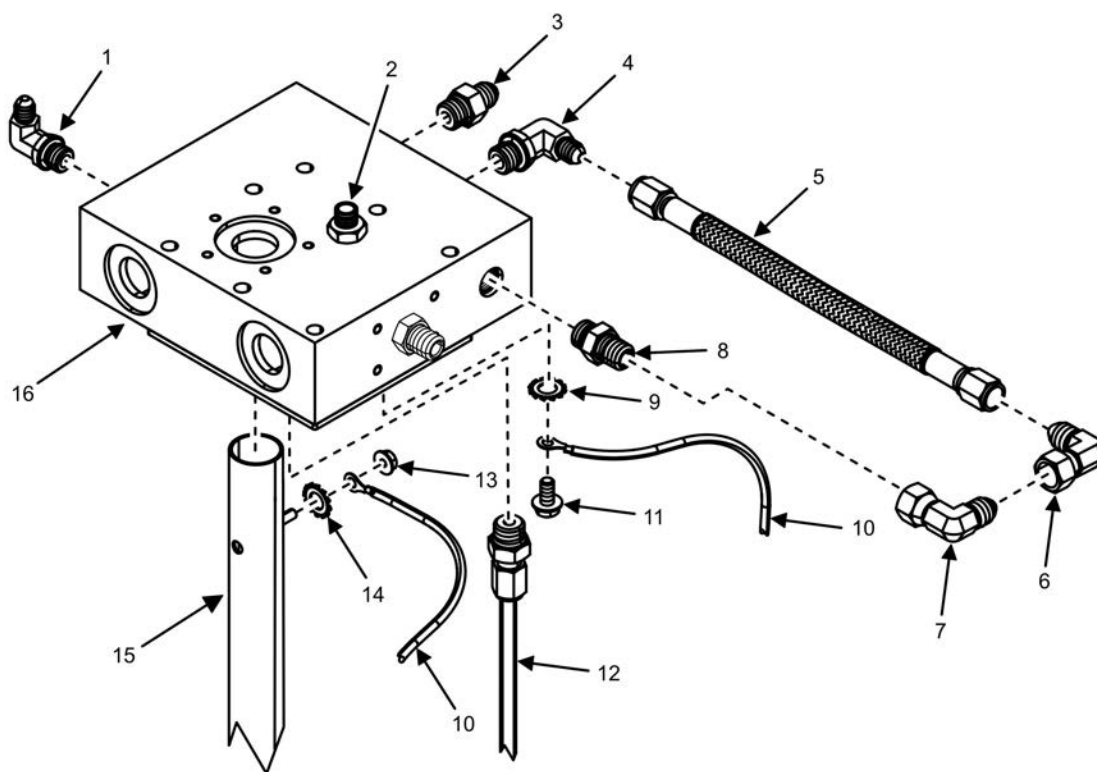
### WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

19. Remove any residual fuel system gasket material from fuel tank and fuel manifold assembly (Figure 2, Item 16) using solvent, brush, and wiping rags.

### END OF TASK

## Disassemble Fuel Manifold Assembly



**Figure 3. Fuel Manifold Assembly — Components.**

### NOTE

The same wire (Figure 3, Item 10) attaches under fuel manifold (Figure 3, Item 16) and to fuel tube (Figure 3, Item 15). Wire is shown twice in Figure 3 for clarity.

1. Remove screw (Figure 3, Item 11), external tooth lock washer (Figure 3, Item 9), and wire (Figure 3, Item 10) from under fuel manifold (Figure 3, Item 16).
2. Remove nut (Figure 3, Item 13), external tooth lock washer (Figure 3, Item 14), and wire (Figure 3, Item 10) from stud of fuel tube (Figure 3, Item 15).
3. Remove main and auxiliary fuel pumps (WP 0045, Remove/Install Fuel Pump, Main/Auxiliary).
4. Remove fuel level sensor (WP 0051, Remove/Install Fuel Level Sensor).
5. Remove fuel strainers (WP 0044, Service Fuel System).
6. Disconnect fuel auxiliary line (Figure 3, Item 5) from fuel manifold (Figure 3, Item 16).
7. Inspect fuel auxiliary line (Figure 3, Item 5) for obvious signs of damage and replace as required.
8. Inspect two elbow fittings (Figure 3, Items 6 and 7) on fuel auxiliary line (Figure 3, Item 5) for obvious signs of damage and replace damaged elbow fittings (Figure 3, Items 6 and 7) as required.
9. Remove two fuel supply tubes (Figure 3, Item 12) from fuel manifold (Figure 3, Item 16).
10. Inspect two fuel supply tubes (Figure 3, Item 16) for obvious signs of damage and replace as required.
11. Remove two pump fittings (Figure 3, Item 8) from fuel manifold (Figure 3, Item 16).
12. Inspect two pump fittings (Figure 3, Item 8) for obvious signs of damage and replace as required.

**NOTE**

Note orientation of auxiliary fuel elbow (Figure 3, Item 1) before removal to aid in installation.

13. Remove auxiliary fuel elbow (Figure 3, Item 1) and straight fitting (Figure 3, Item 2) from fuel manifold (Figure 3, Item 16).
14. Inspect auxiliary fuel elbow (Figure 3, Item 1) and straight fitting (Figure 3, Item 2) for obvious signs of damage. Replace as required.
15. Remove elbow (Figure 3, Item 4) from fuel manifold assembly (Figure 2, Item 16).
16. Inspect elbow (Figure 3, Item 4) for obvious signs of damage. Replace as required.
17. Remove straight fitting (Figure 3, Item 3) from fuel manifold assembly (Figure 2, Item 16).
18. Inspect straight fitting (Figure 3, Item 3) for obvious signs of damage. Replace as required.

**END OF TASK****Inspect Fuel Manifold****NOTE**

Fuel tube (Figure 3, Item 15) is permanently attached to fuel manifold (Figure 3, Item 16) at assembly. If either part is damaged, both parts must be replaced.

1. Inspect fuel manifold (Figure 3, Item 16) and fuel tube (Figure 3, Item 15) for cracks, leaks, and other signs of obvious damage. If either part is damaged, replace fuel manifold (Figure 3, Item 16) and fuel tube (Figure 3, Item 15).

**WARNING**

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

2. Remove any residual sealant from fuel manifold ports and all fittings that will be reused at assembly with brush and dry cleaning solvent.

**END OF TASK****Assemble Fuel Manifold Assembly****NOTE**

Wipe down fuel lines, parts, and fittings with wiping rag prior to installation.

If replacing fuel manifold (Figure 3, Item 16), new fuel tube (Figure 3, Item 15) must be assembled to new fuel manifold (Figure 3, Item 16) using primer and adhesive. Cure time for this process is 24 hr before the assembly can be exposed to fuel.

1. Apply primer and adhesive to mounting surfaces of fuel tube (Figure 3, Item 15) and fuel manifold (Figure 3, Item 16).
2. Insert fuel tube (Figure 3, Item 15) into fuel manifold (Figure 3, Item 16).
3. Remove any beads of adhesive from inside fuel tube (Figure 3, Item 15) and fuel manifold (Figure 3, Item 16). Adhesive must cure for 24 hr before contact with fuel.

**NOTE**

To provide proper seal against fuel leaks, apply thread sealant to pipe threads of all fittings prior to assembly. Thread sealant must cure for 30 min before fuel manifold can be exposed to fuel.

4. Apply thread sealant to pipe threads of straight fitting (Figure 3, Item 3).
5. Install straight fitting (Figure 3, Item 3) to fuel manifold (Figure 3, Item 16) to a torque value of 20 ft/lb (27 Nm).
6. Apply thread sealant to pipe threads of elbow (Figure 3, Item 4).
7. Install elbow (Figure 3, Item 4) to proper orientation on fuel manifold (Figure 3, Item 16) to a torque value 20 ft/lb (27 Nm).
8. Apply thread sealant to pipe threads of auxiliary fuel elbow (Figure 3, Item 1) and straight fitting (Figure 3, Item 2).
9. Install auxiliary fuel elbow (Figure 3, Item 1) to proper orientation on fuel manifold (Figure 3, Item 16) and straight fitting (Figure 3, Item 2) to a torque value of 20 ft/lb (27 Nm).
10. Apply thread sealant to pipe threads of two pump fittings (Figure 3, Item 8).
11. Install two pump fittings (Figure 3, Item 8) to fuel manifold (Figure 3, Item 16) to a torque value of 20 ft/lb (27 Nm).
12. Apply thread sealant to pipe threads of two fuel supply tubes (Figure 3, Item 12).
13. Install fuel supply tubes (Figure 3, Item 12) to fuel manifold (Figure 8, Item 16) to a torque value of 20 ft/lb (27 Nm).
14. Apply thread sealant to pipe threads of two elbow fittings (Figure 3, Items 6 and 7) if removed.
15. Install two elbow fittings (Figure 3, Items 6 and 7) to fuel auxiliary line (Figure 3, Item 5) as required to a torque value of 150 – 168 ft/lb (17 – 19 Nm).
16. Install fuel auxiliary line (Figure 3, Item 5) to elbow fitting (Figure 3, Item 4) on fuel manifold (Figure 3, Item 16) assembly.

**NOTE**

The same wire (Figure 3, Item 10) attaches under fuel manifold (Figure 3, Item 16) and to fuel tube (Figure 3, Item 15). Wire is shown twice in Figure 3 for clarity.

17. Install screw (Figure 3, Item 11), external tooth lock washer (Figure 3, Item 9), and wire (Figure 3, Item 10) to under fuel manifold (Figure 3, Item 16). Torque screw (Figure 3, Item 11) to 44 – 53 in/lb (5 – 6 Nm).
18. Install nut (Figure 3, Item 13), external tooth lock washer (Figure 3, Item 14), and wire (Figure 3, Item 10) from stud of fuel tube (Figure 3, Item 15). Torque nut (Figure 3, Item 13) to 1 ft/lb (1 – 2 Nm).
19. Install fuel plugs and strainers (WP 0040, Service Fuel System).
20. Install fuel level sensor (WP 0046, Remove/Install Fuel Level Sensor).
21. Install fuel pumps (WP 0041, Remove/Install Fuel Pump, Main/Auxiliary).

**END OF TASK****Install Fuel Manifold Assembly****NOTE**

Wipe down fuel lines, parts, and fittings with wiping rag prior to installation.

1. Install gasket retainer (Figure 2, Item 15) if removed.

- a. Insert gasket retainer (Figure 2, Item 15) through opening in fuel tank and align mounting holes.
  - b. Install two flat screws (Figure 2, Item 14) through mounting holes in tank to secure gasket retainer (Figure 2, Item 15) to inside fuel tank.
  - c. Torque two flat screws (Figure 2, Item 14) to 8 – 10 in/lb (1 Nm).
2. Position new fuel system gasket (Figure 2, Item 13) on top of fuel tank and align mounting holes.
3. Position fuel manifold assembly (Figure 2, Item 16) to top of fuel tank and fuel system gasket (Figure 2, Item 13) and align mounting holes.
4. Secure fuel manifold assembly (Figure 2, Item 16) to fuel tank by installing six screws (Figure 2, Item 3) with six flat washers (Figure 2, Item 2) and six new sealing washers (Figure 2, Item 1) through fuel manifold assembly (Figure 2, Item 16) and gasket retainer (Figure 2, Item 15).
5. Tighten six screws (Figure 2, Item 3) in a cross pattern to a torque value of 43 – 47 in/lb (5 Nm).
6. Install auxiliary fuel vent line (Figure 2, Item 7) to straight fitting (Figure 3, Item 2) on fuel manifold assembly (Figure 2, Item 16). Torque to 16 – 18 ft/lb (22 – 24 Nm).
7. Install auxiliary fuel intake line (Figure 2, Item 17) to elbow (Figure 3, Item 1) on fuel manifold assembly (Figure 2, Item 16). Torque to 16 – 18 ft/lb (22 – 24 Nm).
8. Install fuel return line (Figure 2, Item 8) to fuel manifold assembly (Figure 2, Item 16).
9. Install fuel supply line (Figure 2, Item 10) to main fuel pump (Figure 2, Item 9).
10. Install screw (Figure 2, Item 5), external tooth lock washer (Figure 2, Item 6), and ground wire (Figure 2, Item 4) to fuel manifold assembly (Figure 2, Item 16). Torque screw (Figure 2, Item 5) to 44 – 53 in/lb (5 – 6 Nm).
11. Connect electrical connectors (Figure 2, Item 12) to engine wiring harness connectors (Figure 2, Item 11).
12. Fill fuel tank (WP 0044, Service Fuel System).
13. Install brackets and relay panel (WP 0038, Remove/Install Relay Panel).
14. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
15. Purge fuel system (WP 0044, Service Fuel System).
16. Dispose of captured fuel and soiled rags IAW local SOP.
17. Turn engine control switch to PRIME & RUN (TM 9-6115-751-10).
18. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
19. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL FUEL FILTER/WATER SEPARATOR ASSEMBLY**

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**INITIAL SETUP:**

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)  
 Wrench, Oil Filter, Strap (WP 0179, Table 2, Item 37)  
 Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0179, Table 2, Item 39)  
 Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 31)

**Materials/Parts**

Separator, fuel water (1) (WP 0118, Repair Parts List, Figure 13, Item 7)  
 Cap set, protective (WP 0180, Expendable and Durable Items List, Item 8)  
 Grease, electrically conductive (WP 0180, Item 22)  
 Pan, drain (WP 0180, Item 30)  
 Rag, wiping (2) (WP 0180, Item 33)  
 Sealant (WP 0180, Item 34)  
 Tag, marker (WP 0180, Item 37)

**Personnel Required**

91D (1)

**References**

WP 0019, Remove/Install Air Intake Hose Assemblies  
 WP 0044, Service Fuel System  
 WP 0048, Replace Fuel Filter/Water Separator Element  
 WP 0087, Remove/Install Engine ECM Wiring Harness

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)  
 Engine cool  
 Battery ground cable removed (WP 0037, Remove/Install Batteries)

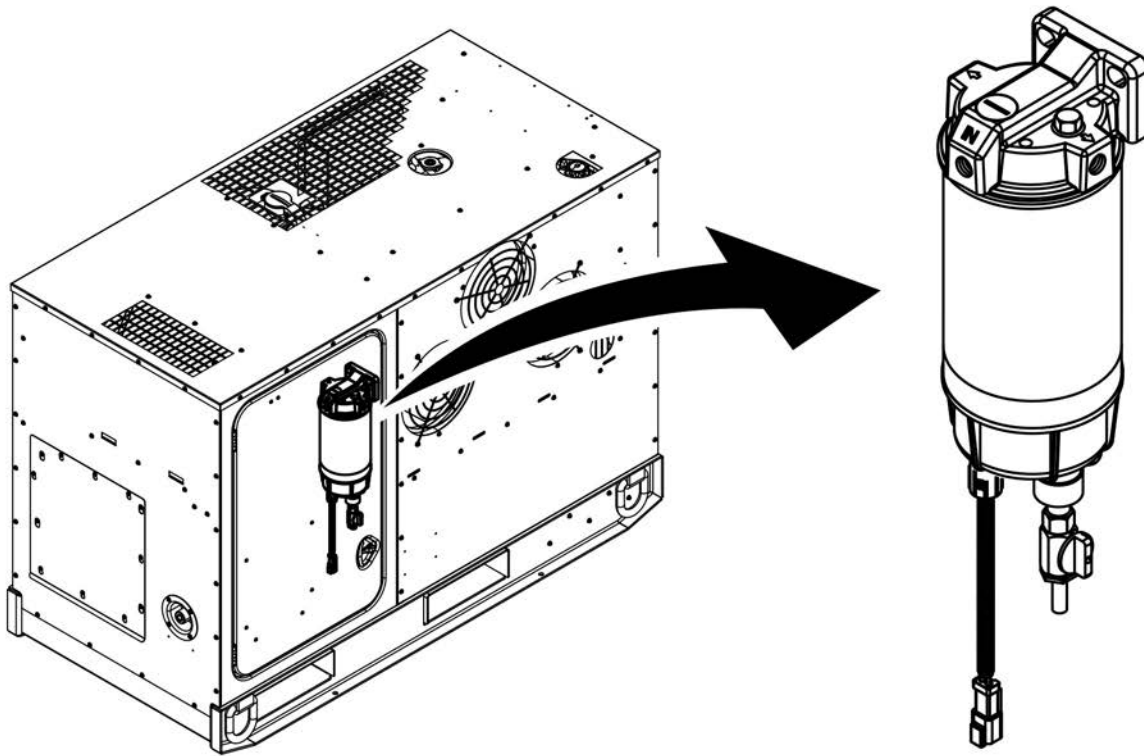
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**REMOVE/INSTALL FUEL FILTER/WATER SEPARATOR ASSEMBLY**

**WARNING**

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

## Remove Fuel Filter/Water Separator Assembly



**Figure 1. Fuel Filter/Water Separator Assembly — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate fuel filter/water separator assembly (Figure 1) through left-side door.
3. Disconnect ECM sensor to better access fuel filter/water separator assembly (WP 0087, Remove/Install Engine ECM Wiring Harness).
4. Remove two clamps securing wiring harness to engine (WP 0087, Remove/Install Engine ECM Wiring Harness).
5. Remove air intake hose from plenum (WP 0019, Remove/Install Air Intake Hose Assemblies).
6. Place suitable container and wiping rag under fuel filter/water separator assembly (Figure 1) to catch spilled fuel.
7. Open drain valve (Figure 2, Item 5) on bottom of bowl (Figure 2, Item 4).
8. Allow fuel to drain into container until flow stops.
9. Close fuel drain valve (Figure 2, Item 5).



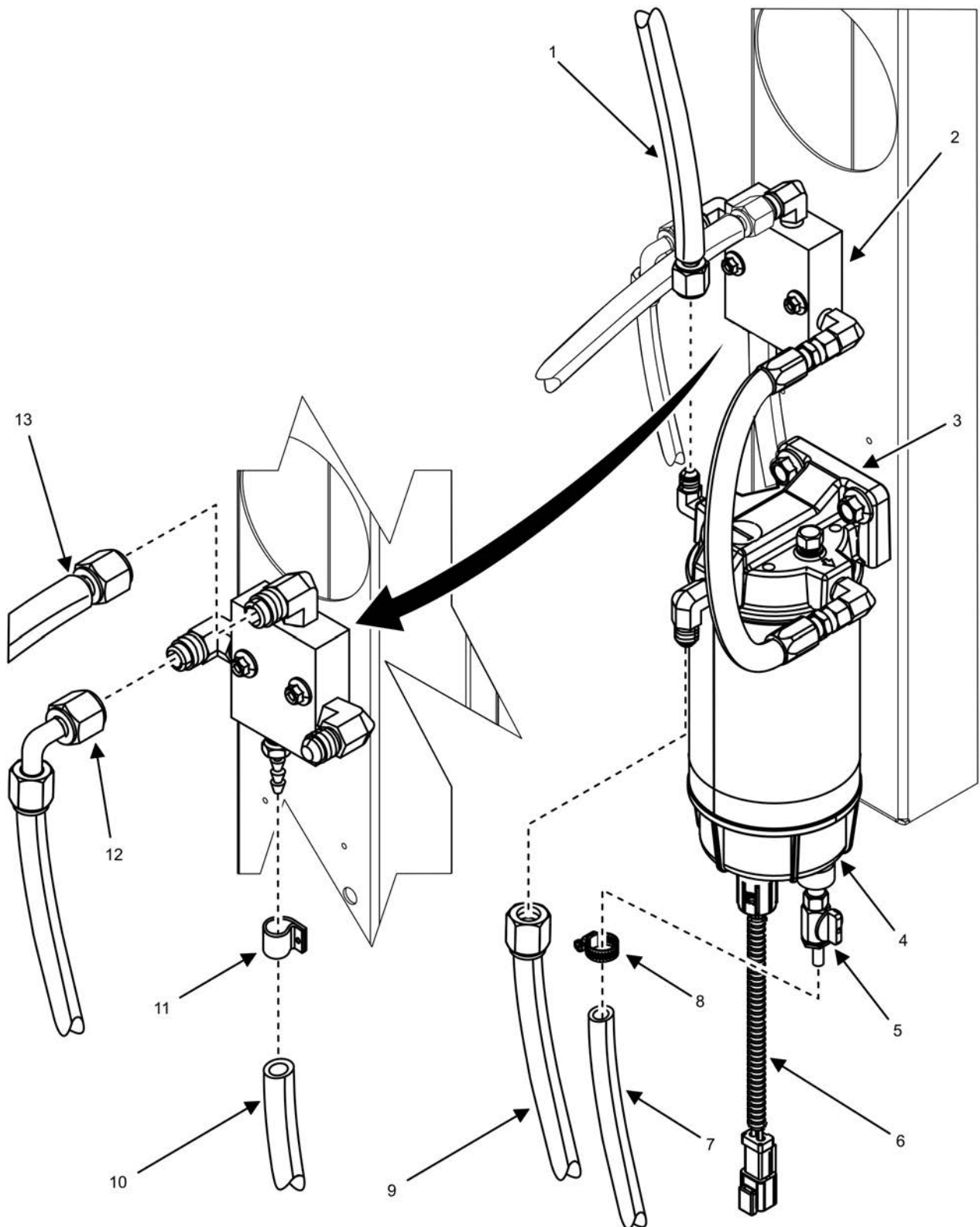


Figure 2. Fuel Filter/Water Separator Assembly — Detail.

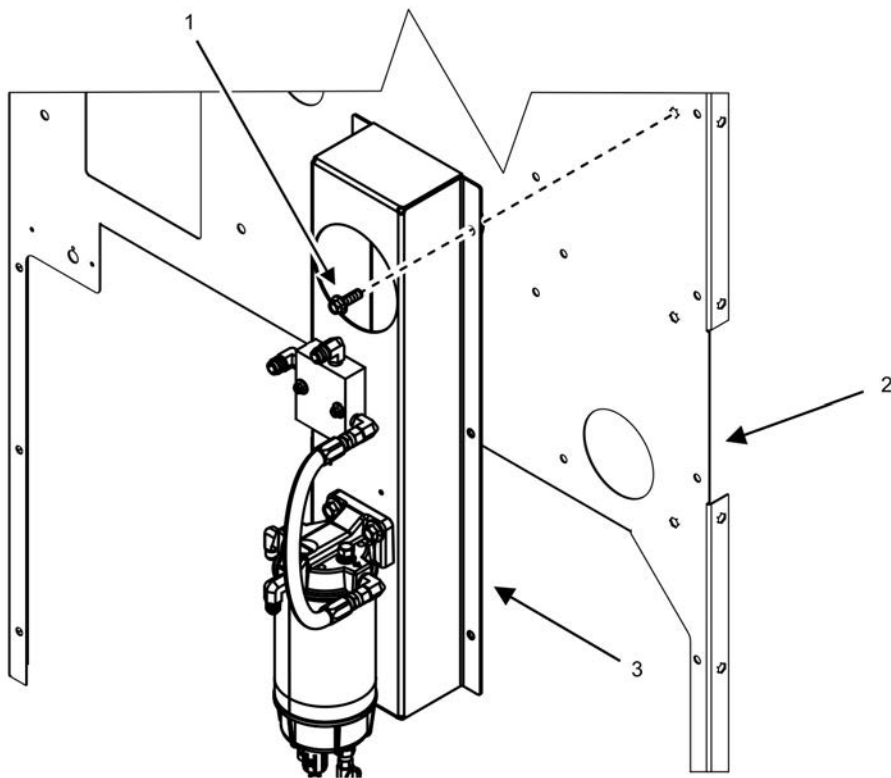
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**NOTE**

Capture spilled fuel and dispose of IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

Tag and identify fuel lines after removal of each line to aid with installation.

10. Remove dirt and debris from head (Figure 2, Item 3) to prevent contamination of fuel system. Use suitable container to capture dirt and debris.
11. Disconnect fuel supply line (Figure 2, Item 9) from tube elbow fitting (Figure 4, Item 10) on head (Figure 2, Item 3).
12. Disconnect engine supply line (Figure 2, Item 1) from tube elbow fitting (Figure 4, Item 12) on head (Figure 2, Item 3).
13. Disconnect engine return line (Figure 2, Item 13) from tube elbow fitting (Figure 4, Item 3) on fuel manifold (Figure 2, Item 2).
14. Disconnect fuel return line (Figure 2, Item 12) from tube elbow fitting (Figure 4, Item 1) on fuel manifold (Figure 2, Item 2).
15. Loosen and slide back clamp (Figure 2, Item 11) on heater hose (Figure 2, Item 10) away from fuel manifold joint (Figure 4, Item 13) on fuel manifold (Figure 2, Item 2).
16. Remove heater hose (Figure 2, Item 10) from fuel manifold joint (Figure 4, Item 13) on fuel manifold (Figure 2, Item 2).
17. Tag and disconnect electrical sensor (Figure 2, Item 6) from unit wiring harness (not shown).
18. Loosen clamp (Figure 2, Item 8) and remove drain hose (Figure 2, Item 7) from drain valve (Figure 2, Item 5).
19. Inspect drain hose (Figure 2, Item 7) for obvious signs of damage and replace as required.



**Figure 3. Fuel Filter/Water Separator Assembly — Removal.**

20. Remove six screws (Figure 3, Item 1) securing air plenum (Figure 3, Item 3) to unit bulkhead (Figure 3, Item 2).
21. Remove fuel filter/water assembly (Figure 4, Item 9) attached to air plenum (Figure 4, Item 4) from unit.

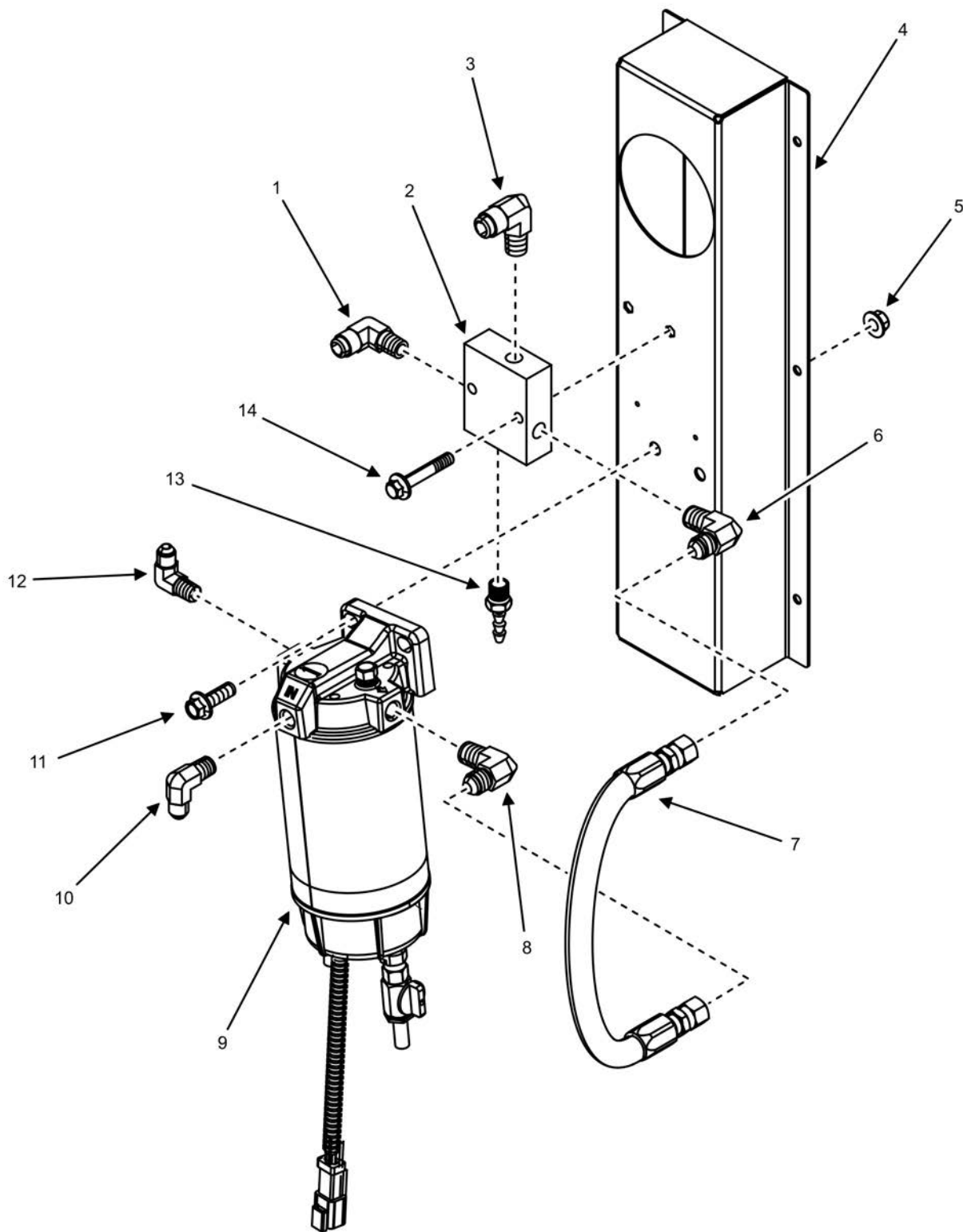


Figure 4. Fuel Filter/Water Separator Assembly — Removal.

22. Disconnect connecting fuel line (Figure 4, Item 7) from tube elbow (Figure 4, Item 8) on head (Figure 2, Item 3) and tube elbow (Figure 4, Item 6) on fuel manifold (Figure 4, Item 2).
23. Remove two mounting screws (Figure 4, Item 11) and two nuts (Figure 4, Item 5) securing fuel filter/water separator assembly (Figure 4, Item 9) to air plenum (Figure 4, Item 4).
24. Remove fuel filter/water separator assembly (Figure 4, Item 9) from air plenum (Figure 4, Item 4).
25. Remove two screws (Figure 4, Item 14) securing fuel manifold (Figure 4, Item 2) to air plenum (Figure 4, Item 4).
26. Inspect all tube elbows (Figure 4, Items 1, 3, 6, 8, 10, and 12) and fuel manifold joint (Figure 4, Item 13) for cracks, damaged threads, and other obvious signs of damage. Replace tube elbows (Figure 4, Items 1, 3, 6, 8, 10, and 12) and fuel manifold joint (Figure 4, Item 13) as required.

## END OF TASK

### Inspect Fuel Filter/Water Separator Assembly

1. Inspect fuel filter/water separator assembly (Figure 1) for obvious signs of damage and replace as required.
2. Inspect electrical connector (Figure 2, Item 5) for damage and replace fuel filter/water separator assembly (Figure 1) as required.
3. Inspect mounting screws (Figure 4, Item 11) and nuts (Figure 4, Item 5) for obvious signs of damage and replace as required.

## END OF TASK

### Install Fuel Filter/Water Separator Assembly

1. Replace fuel filter/water separator element prior to installation (WP 0048, Replace Fuel Filter/Water Separator Element).

## NOTE

Use pipe thread sealant on all pipe threads of tube elbow fittings (Figure 4, Items 1, 3, 6, 8, 10, and 12) and fuel manifold joint (Figure 4, Item 13). Cure time is 30 min to use fuel system and 72 hr for full strength.

2. Apply pipe thread sealant to tube elbow fitting (Figure 4, Items 1, 3, 6, 8, 10, and 12) and fuel manifold joint (Figure 4, Item 13) if required.
3. Install tube elbow fitting (Figure 4, Items 1, 3, 6, 8, 10, and 12) and fuel manifold joint (Figure 4, Item 13) to head or fuel manifold if required.
4. Install drain hose (Figure 2, Item 7) to drain valve (Figure 2, Item 5) and secure with hose clamp (Figure 2, Item 8).
5. Position fuel filter/water separator assembly (Figure 4, Item 9) to air plenum (Figure 4, Item 4) and align mounting holes.
6. Secure fuel filter/water separator assembly (Figure 4, Item 9) to air plenum (Figure 4, Item 4) with two mounting screws (Figure 4, Item 11) and nuts (Figure 4, Item 5).
7. Tighten two mounting screws/nuts (Figure 4, Items 5 and 11) to 35 – 42 ft/lb (48 – 57 Nm).

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**NOTE**

Place a suitable container under fuel filter/water separator assembly (Figure 1) to catch spilled fuel. Dispose of captured fuel IAW local SOP.

Remove all caps/plugs from fuel lines/fittings prior to installation of each fuel line.

Remove all tags from fuel lines and hoses after installation is complete and unit has been tested for proper operation.

8. Install connecting fuel line (Figure 4, Item 7) to tube elbow (Figure 4, Item 6) on fuel manifold (Figure 2, Item 2).
9. Install opposite end of connecting fuel line (Figure 4, Item 7) to tube elbow fitting (Figure 4, Item 8) on head (Figure 2, Item).
10. Position air plenum (Figure 3, Item 3) with head (Figure 2, Item 3) and fuel manifold (Figure 2, Item 2) attached to unit bulkhead (Figure 2, Item 2).
11. Install air plenum (Figure 3, Item 3) to unit bulkhead (Figure 3, Item 2) with six screws (Figure 3, Item 1).
12. Torque screws (Figure 3, Item 1) to 87 – 105 in/lb (10 – 12 Nm).
13. Connect unit wiring harness (not shown) to electrical sensor (Figure 2, Item 6).
14. Install heater hose (Figure 2, Item 10) to fuel manifold joint (Figure 4, Item 13) on fuel manifold (Figure 2, Item 2) and secure with hose clamp (Figure 2, Item 11).
15. Connect fuel return line (Figure 2, Item 12) to tube elbow fitting (Figure 4, Item 1) on fuel manifold (Figure 2, Item 2).
16. Connect engine return line (Figure 2, Item 13) to tube elbow fitting (Figure 4, Item 3) on fuel manifold (Figure 2, Item 2).
17. Connect engine supply line (Figure 2, Item 1) to tube elbow fitting (Figure 4, Item 12) on head (Figure 2, Item 3).
18. Connect fuel supply line (Figure 2, Item 9) to tube elbow fitting (Figure 4, Item 10) on head (Figure 2, Item 3).
19. Install air intake hose to plenum (WP 0019, Remove/Install Air Intake Hose Assemblies).
20. Install engine ECM wiring harness clamps to engine (WP 0087, Remove/Install Engine ECM Wiring Harness).
21. Connect engine ECM sensor (WP 0087, Remove/Install Engine ECM Wiring Harness).
22. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
23. Purge fuel system (WP 0044, Service Fuel System).
24. Close generator set doors.
25. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
26. Start engine and check for leaks and proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
27. Repair as required.
28. Dispose of spilled fuel IAW local SOP.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REPLACE FUEL FILTER/WATER SEPARATOR ELEMENT**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)  
Wrench, Oil Filter Strap (1) (WP 0179, Table 2, Item 37)

**Materials/Parts**

Filter, fuel (1) (WP 0118, Repair Parts List, Figure 13, Item 8)  
Cap set, protective (WP 0180, Expendable and Durable Items List, Item 8)  
Fuel, diesel, DF-2 (WP 0180, Item 21)  
Grease, electrically conductive (WP 0180, Item 22)  
Pan, drain (WP 0180, Item 30)  
Rag, wiping (2) (WP 0180, Item 33)  
Tag, marker (WP 0180, Item 37)

**Personnel Required**

91D (1)

**References**

WP 0044, Service Fuel System

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)  
Engine cool  
Battery ground cable removed (WP 0037, Remove/Install Batteries)

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**REPLACE FUEL FILTER/WATER SEPARATOR ELEMENT****WARNING**

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

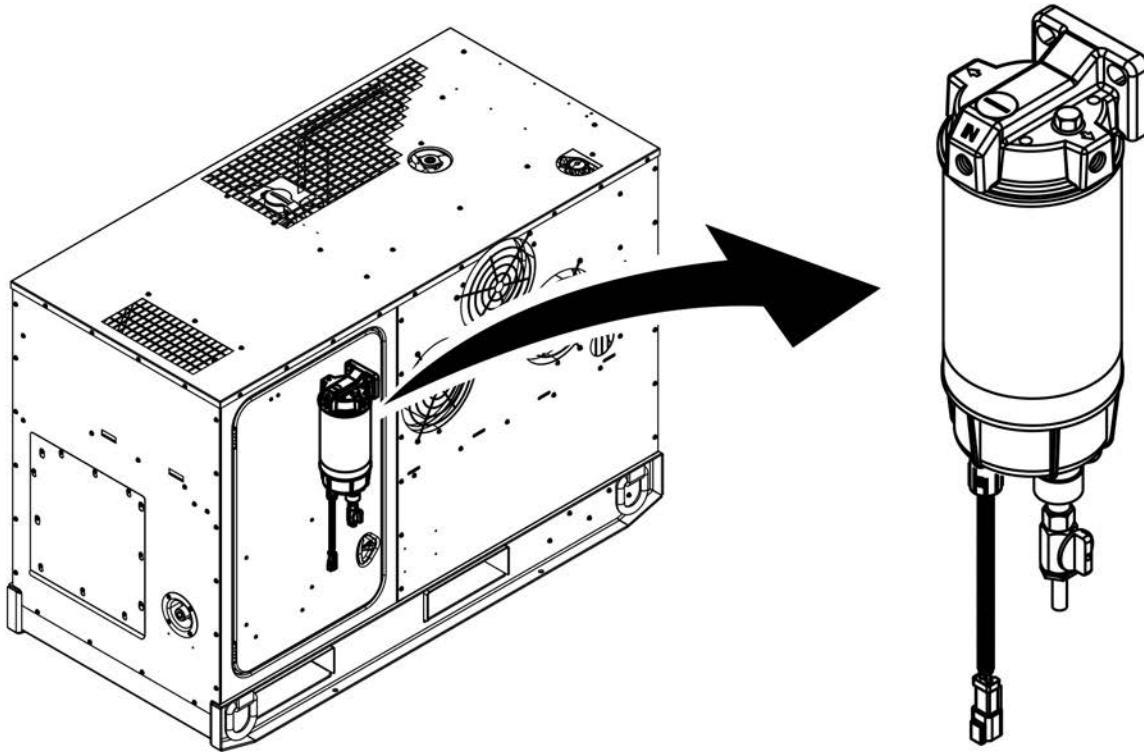
**Remove Fuel Filter/Water Separator Element****NOTE**

Capture spilled fuel and dispose of IAW local SOP.

Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

- Ensure equipment conditions are met in order presented in initial setup.
- Open left-side door and locate fuel filter/water separator (Figure 1) mounted on interior body panel.

3. Tag and disconnect electrical connector (Figure 2, Item 5) from wiring harness (not shown).



**Figure 1. Fuel Filter/Water Separator — Location.**

4. Open drain valve (Figure 2, Item 4) on bottom of water bowl (Figure 2, Item 3).
5. Place drain pan and wiping rag under fuel filter/water separator element (Figure 2, Item 2).
6. Allow fuel to drain into drain pan until flow stops.
7. Close drain valve (Figure 2, Item 4).
8. Remove dirt and debris from area around fuel filter/water separator element (Figure 2, Item 2) to prevent contamination.
9. Rotate water bowl (Figure 2, Item 3) counterclockwise to disconnect from fuel filter/water separator element (Figure 2, Item 2).
10. Remove fuel filter/water separator element (Figure 2, Item 2) with gasket (not shown) from fuel filter/water separator head (Figure 2, Item 1).
11. Remove any remaining gasket residue from fuel filter/water separator head (Figure 2, Item 1) and water bowl (Figure 2, Item 3).
12. Rotate fuel filter/water separator element (Figure 2, Item 2) counterclockwise to remove from fuel filter/water separator head (Figure 2, Item 1) using filter wrench.
13. Inspect water bowl (Figure 2, Item 3) for cracks, leaks, and other signs of obvious damage. Replace as required or set aside for reuse.



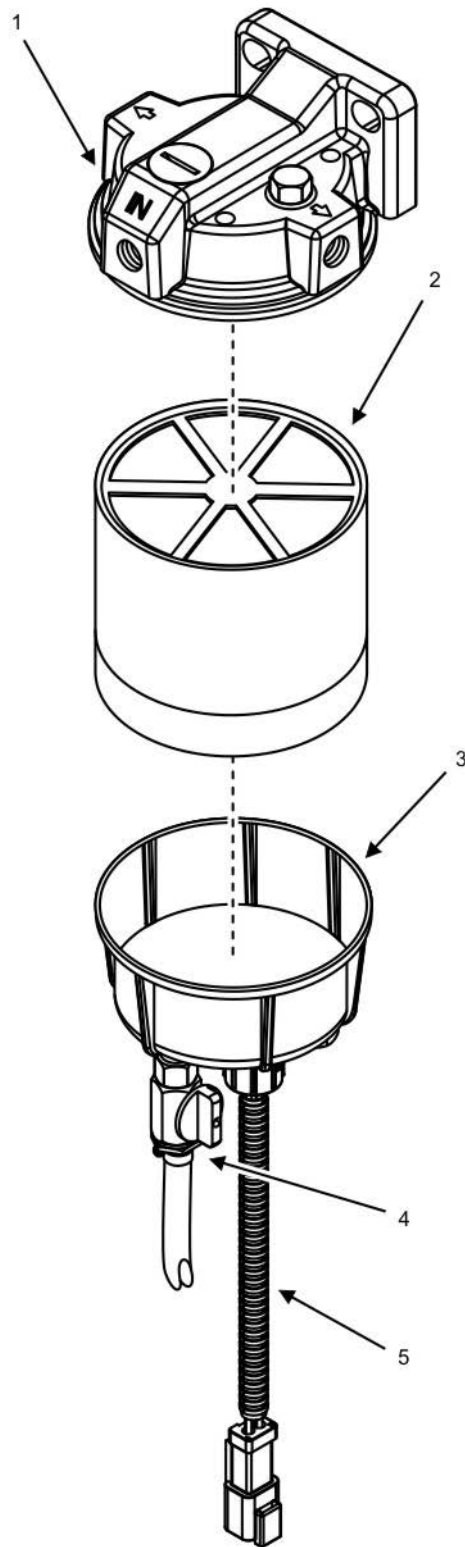


Figure 2. Fuel Filter/Water Separator — Detail.

14. Discard fuel filter/water separator element (Figure 2, Item 2) and gasket (not shown) IAW local SOP.
15. Remove dirt and fuel from fuel filter/water separator head (Figure 2, Item 1) and water bowl (Figure 2, Item 3).
16. Discard captured fuel and soiled rags IAW local SOP.

## END OF TASK

### Install Fuel Filter/Water Separator Element

#### NOTE

Wipe down fuel lines, parts, and fittings with wiping rag prior to installation.

1. Place drain pan under fuel filter/water separator head (Figure 2, Item 1) mounting location for fuel filter/water separator element (Figure 2, Item 2) installation.

#### NOTE

Gaskets (not shown) are included with fuel filter/water separator element (Figure 2, Item 2).

2. Apply light film of clean diesel fuel to water bowl (Figure 2, Item 3) gasket (not shown).
3. Rotate water bowl (Figure 2, Item 3) clockwise and install onto bottom of fuel filter/water separator element (Figure 2, Item 2) and finger-tighten.
4. Apply light film of clean diesel fuel to new fuel filter/water separator element (Figure 2, Item 2) gasket (not shown).
5. Ensure drain valve (Figure 2, Item 4) on bottom of water bowl (Figure 2, Item 3) is closed.
6. Fill new fuel filter/water separator element (Figure 2, Item 2) to level of the mounting threads with approved diesel fuel.
7. Install new fuel filter/water separator element (Figure 2, Item 2) onto fuel filter/water separator head (Figure 2, Item 1).
8. Rotate fuel filter/water separator element (Figure 2, Item 2) clockwise until gasket makes contact with fuel filter/water separator head (Figure 2, Item 1).
9. Rotate fuel filter/water separator element (Figure 2, Item 2) an additional one-third turn clockwise to secure.
10. Remove drain pan from unit and dispose of captured fuel IAW local SOP.
11. Connect electrical connector (Figure 2, Item 5) to wiring harness (not shown).
12. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
13. Purge fuel system (WP 0044, Service Fuel System).
14. Close generator set doors.
15. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
16. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
17. Repair as required.

## END OF TASK

## END OF WORK PACKAGE

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL FUEL LINES**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Hose, fuel 5/32 in. ID (WP 0172, Repair Parts List, Figure 67, Item 32)

Line, fuel (WP 0116, Repair Parts List, Figure 11, Item 21)

Line, fuel (WP 0116, Figure 11, Item 22)

Line, fuel (WP 0118, Repair Parts List, Figure 13, Item 10)

Line, fuel (WP 0118, Figure 13, Item 14)

Line, fuel (WP 0118, Figure 13, Item 15)

Line, fuel (WP 0118, Figure 13, Item 16)

Line, fuel (WP 0118, Figure 13, Item 17)

Line, fuel (WP 0119, Repair Parts List, Figure 14, Item 3)

Tube, flexible (2) (WP 0172, Figure 67, Item 27)

Cap set, protective (WP 0180, Expendable and Durable Items List, Item 8)

Grease, electrically conductive (WP 0180, Item 22)

**Materials/Parts**

Pan, drain (WP 0180, Item 30)

Rag, wiping (16) (WP 0180, Item 33)

**Personnel Required**

91D (1)

Assistant (1)

**References**

WP 0044, Service Fuel System

WP 0034, Remove/Install Interior Body Panels

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

**REMOVE/INSTALL FUEL LINES****WARNING**

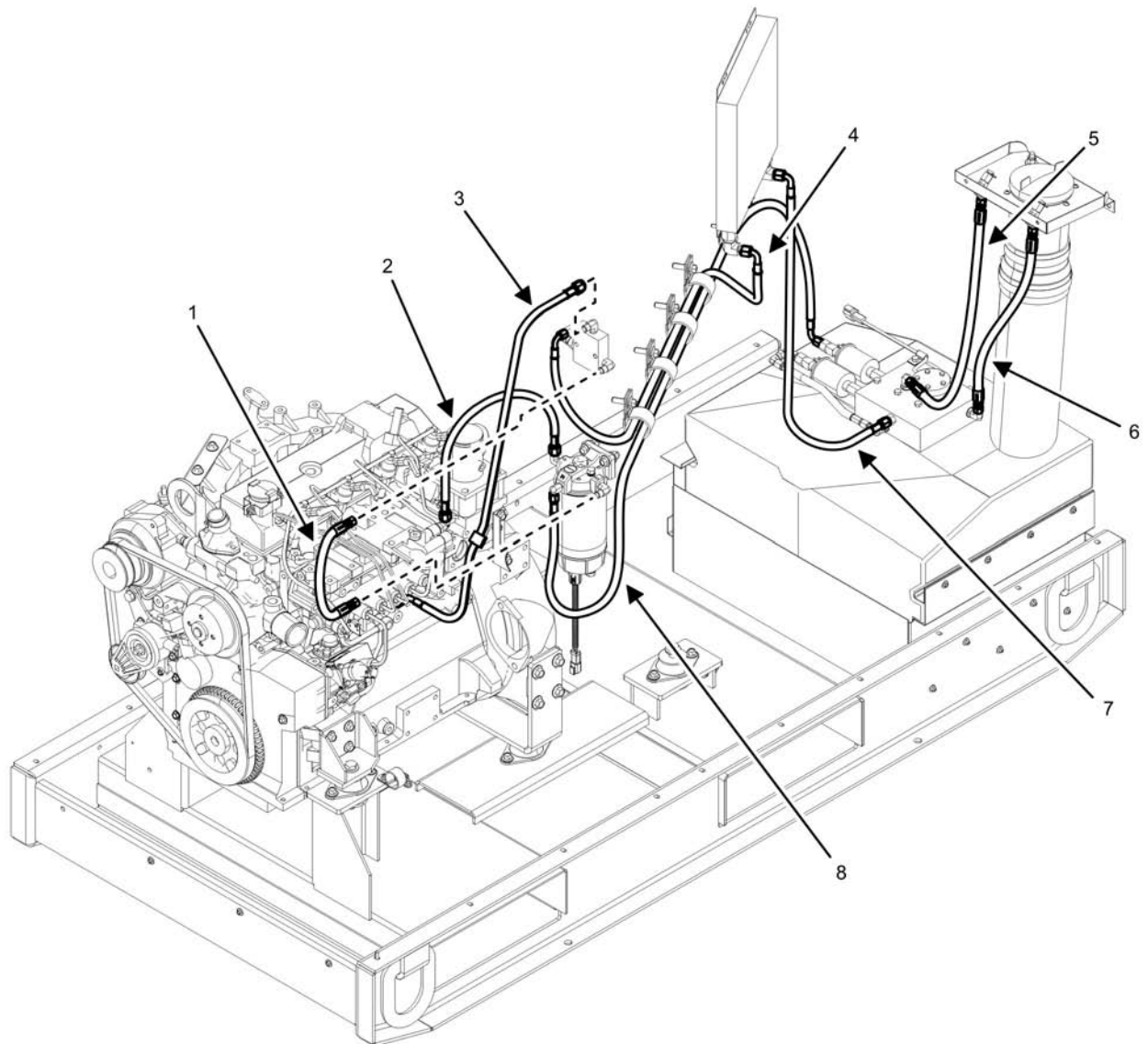
- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

**NOTE**

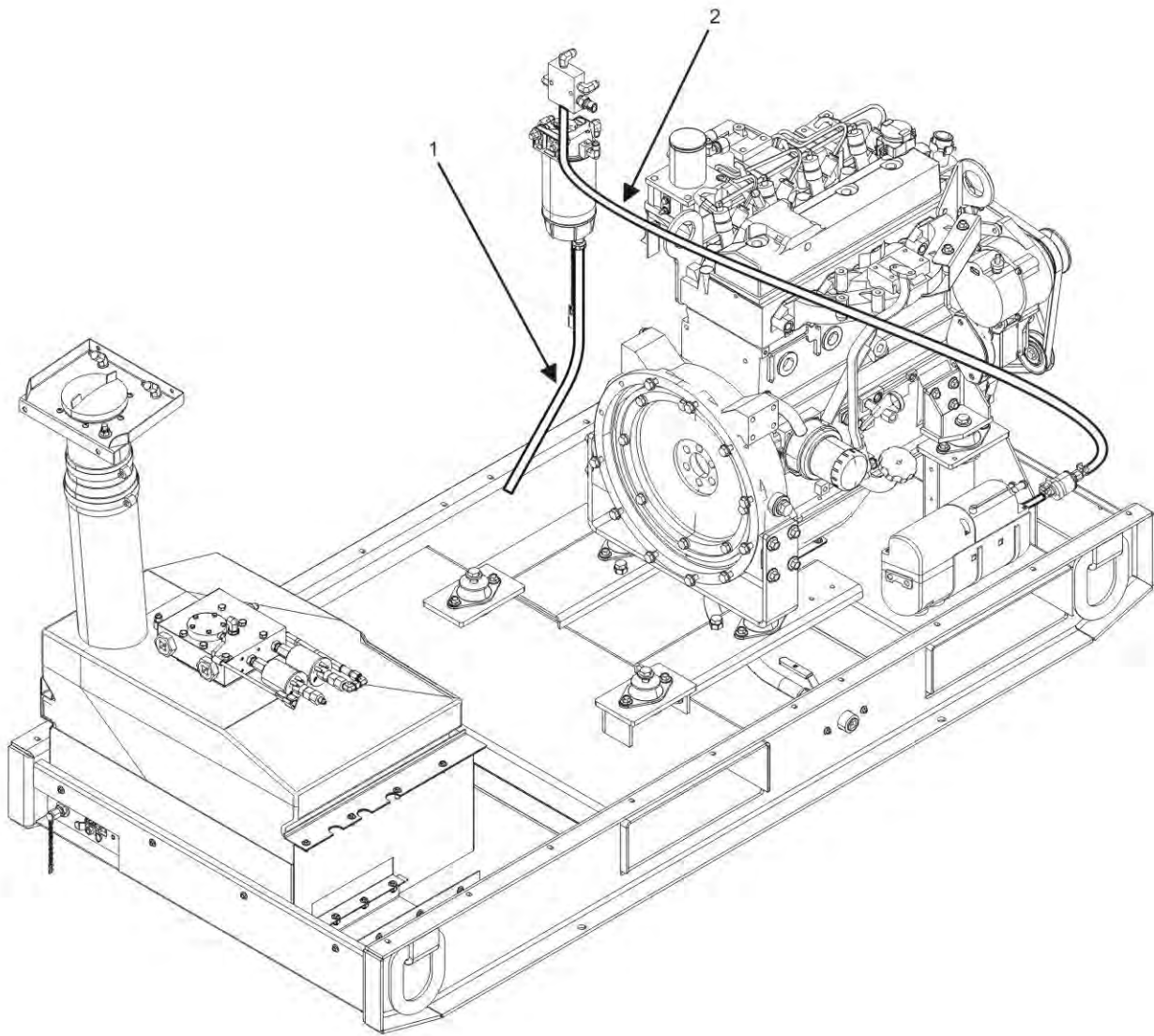
Unit has numerous fuel lines utilizing two attachment methods. Generator set low-pressure fuel lines attach with fittings. Winterization kit fuel line and fuel filter/water separator drain hose connect with flexible hose and clamp bands.

**Remove Fuel Line Assembly Attachments****Table 1. Fuel Hoses — Location.**

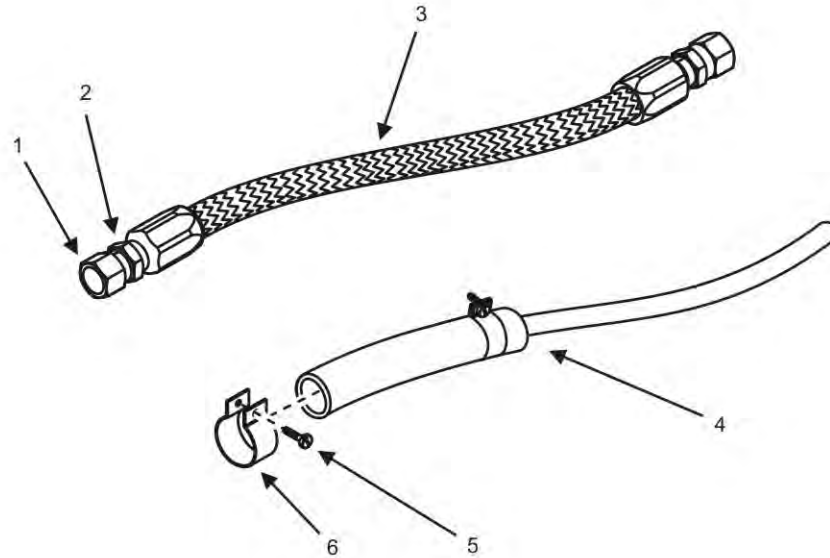
<b>FIGURE #</b>	<b>FIND #</b>	<b>HOSE</b>	<b>EQUIPMENT CONDITIONS</b>
1	1	Connecting Fuel Line	Left-side door opened
1	2	Fuel Supply Engine Line	Left-side door opened
1	3	Fuel Return Engine Line	Left-side door opened
1	4	Fuel Return Line	Rear and left-side door opened
1	5	Auxiliary Fuel Vent Line	Radiator support panel removed (WP 0034, Remove/Install Interior Body Panels)
1	6	Auxiliary Fuel Intake Line	Radiator support panel removed (WP 0034, Remove/Install Interior Body Panels)
1	7	Fuel Line from Fuel Cooler to Fuel Manifold	Radiator support panel removed (WP 0034, Remove/Install Interior Body Panels)
1	8	Fuel Supply Line	Rear and left-side door opened
2	1	Drain Hose	Left-side door opened
2	2	Heater Hose	Left and right-side door opened



**Figure 1. Fuel Hoses Front View — Location.**



**Figure 2. Fuel Hoses Rear View — Location.**



**Figure 3. Fuel Hoses.**

**NOTE**

Figures 1 and 2 display the routing of the generator set fuel hoses except for the fuel tank drain valve assembly.

Table 1 identifies the name of the fuel hose and the specific equipment conditions required to remove and install the fuel hose.

Capture and dispose of spilled fluids IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

1. Ensure equipment conditions are met in order presented in initial setup and Table 1.
2. Locate fuel line to be removed (Figure 1).
3. Place drain pan and wiping rags under fuel line (Figure 3, Item 3) to catch spilled fuel.

**NOTE**

To remove fuel line (Figure 3, Item 3) assembly, secure lock fitting (Figure 3, Item 2) while loosening fuel line fitting (Figure 3, Item 1).

4. Place a suitable wrench on fuel line fitting (Figure 3, Item 1) on fuel line (Figure 3, Item 3).
5. Place a suitable wrench on fuel line lock fitting (Figure 3, Item 2).
6. Loosen fuel line fitting (Figure 3, Item 1) from device using wrenches on fuel line fittings (Figure 3, Items 1 and 2).
7. Remove fuel line (Figure 3, Item 3) from device.
8. Repeat steps 4 through 7 for opposite end of fuel line (Figure 3, Item 3).
9. Remove fuel line (Figure 3, Item 3) from unit.

10. Inspect fuel line (Figure 3, Item 3) for cracks, wear, and other obvious signs of damage and replace as required.
11. Cap component fitting (not shown) and fuel line fittings (Figure 3, Items 1 and 2) to prevent dirt/debris from entering fuel system.

## END OF TASK

### Install Fuel Line with Assembly Attachments

#### NOTE

Capture and dispose of spilled fluid IAW local SOP. Remove cap/plug from fuel lines/fittings before installation.

Wipe down fuel lines, parts, and fittings with wiping rag prior to installation.

1. Place drain pan and wiping rags under fuel line (Figure 3, Item 3) to catch spilled fuel.
2. Remove caps/plugs from fuel line fittings (Figure 3, Items 1 and 2) and component fittings (not shown).

#### NOTE

To install fuel line (Figure 3, Item 3) assembly, secure lock fitting (Figure 3, Item 2) while tightening fuel line fitting (Figure 3, Item 1).

Position fuel line (Figure 3, Item 3) to component fitting (not shown) and finger-tighten fuel line fitting (Figure 3, Item 1).

3. Route opposite end of fuel line (Figure 3, Item 3) to component fitting (not shown).
4. Position fuel line fitting (Figure 3, Item 1) to component fitting (not shown) and finger-tighten.
5. Place a suitable wrench on fuel line fitting (Figure 3, Item 1).
6. Place a suitable wrench on fuel line lock fitting (Figure 3, Item 2).
7. Tighten fuel line fitting (Figure 3, Item 1) on device.
8. Repeat steps 6 through 8 on opposite end of fuel line (Figure 3, Item 3).
9. Remove drain pan and wiping rags from unit.
10. Install interior body panels if required (WP 0034, Remove/Install Interior Body Panels).
11. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
12. Purge fuel system (WP 0044, Service Fuel System).
13. Close all generator set doors.
14. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
15. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
16. Repair as required.

## END OF TASK



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**Remove Fuel Hose with Clamp Bands****NOTE**

Capture and dispose of spilled fluid IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

Winterization kit is optional for AMMPS generator sets. Removal of coolant heater fuel hose is only necessary if winterization kit is installed.

1. Ensure equipment conditions are met in order presented in initial setup and Table 1.
2. Locate fuel hose to be removed (Figure 2).
3. Place drain pan and wiping rags under fuel hose (Figure 3, Item 4) to catch spilled fuel.
4. Loosen clamp band screw (Figure 3, Item 5) on clamp band (Figure 3, Item 6) nearest the component (not shown).
5. Slide clamp band (Figure 3, Item 6) away from component fitting (not shown).
6. Remove fuel hose (Figure 3, Item 4) from component fitting (not shown).
7. Repeat steps 4 through 6 for opposite end of fuel hose (Figure 3, Item 4).
8. Remove fuel hose (Figure 3, Item 4) from unit.
9. Inspect clamp bands (Figure 3, Item 6) for excessive corrosion and other signs of obvious damage and replace as required.
10. Inspect fuel hose (Figure 3, Item 4) for cracks, wear, and other obvious signs of damage and replace as required.

**END OF TASK****Install Fuel Hose with Clamp Bands****NOTE**

Capture and dispose of spilled fluid IAW local SOP. Capture and dispose of spilled fluid IAW local SOP.

Winterization kit is optional for AMMPS. Installation of heater fuel hose is only necessary if winterization kit is installed in unit.

Wipe down fuel lines, parts, and fittings with wiping rag prior to installation.

1. Place drain pan and wiping rags under fuel hose to catch spilled fuel.
2. Install fuel hose (Figure 3, Item 4) onto component fitting (not shown).
3. Slide and position clamp band (Figure 3, Item 6) over component fitting (not shown).
4. Tighten clamp band screw (Figure 3, Item 5) and secure fuel hose (Figure 3, Item 4) to component fitting (not shown).
5. Repeat steps 2 through 4 for opposite end of fuel hose (Figure 3, Item 4).
6. Remove drain pan and wiping rags from unit.
7. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
8. Purge fuel system (WP 0044, Service Fuel System).
9. Close all generator set doors.

10. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
11. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
12. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL FUEL COOLER**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Cooler, fuel (WP 0119, Repair Parts List, Figure 14, Item 1)

Cap set, protective (WP 0180, Expendable and Durable Items List, Item 8)

Pan, drain (WP 0180, Item 30)

Grease, electrically conductive (WP 0180, Item 22)

Rag, wiping (2) (WP 0180, Item 33)

Sealant (WP 0180, Item 34)

Tag, marker (WP 0180, Item 37)

**Personnel Required**

91D (1)

Assistant (1)

**References**

WP 0044, Service Fuel System

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

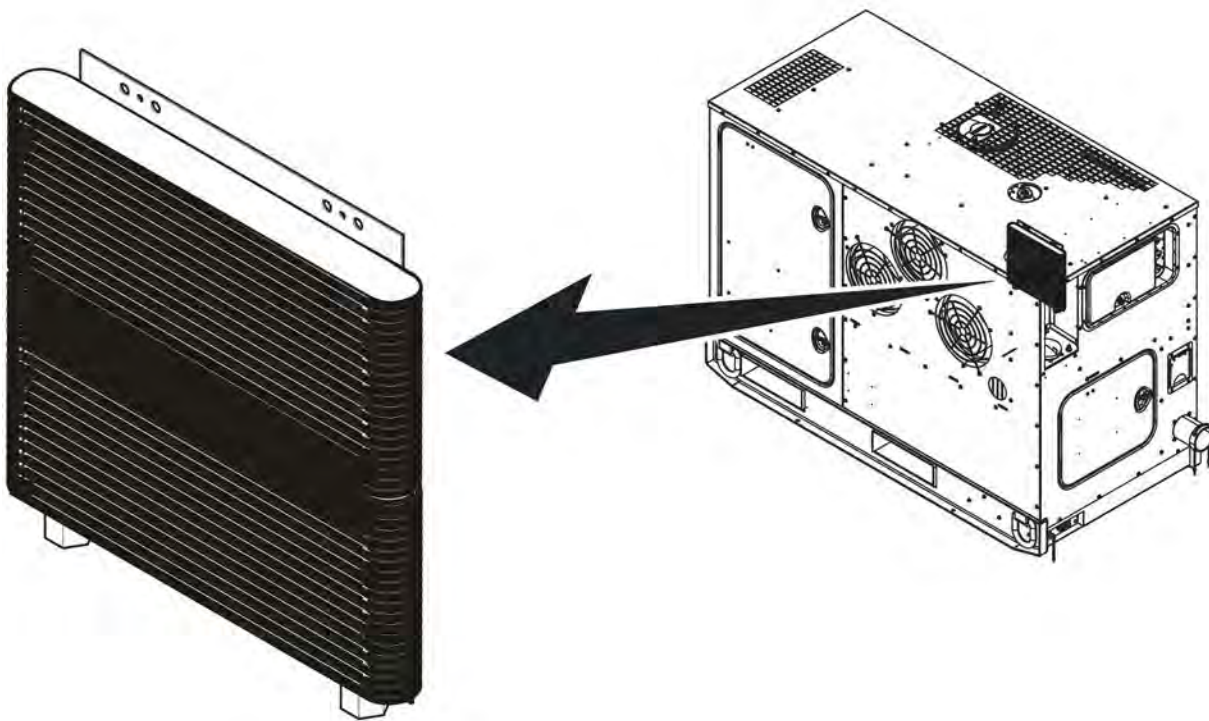
Battery ground cable removed (WP 0037, Remove/Install Batteries)

Top body panel removed (WP 0029, Remove/Install Top Body Panel)

**REMOVE/INSTALL FUEL COOLER****WARNING**

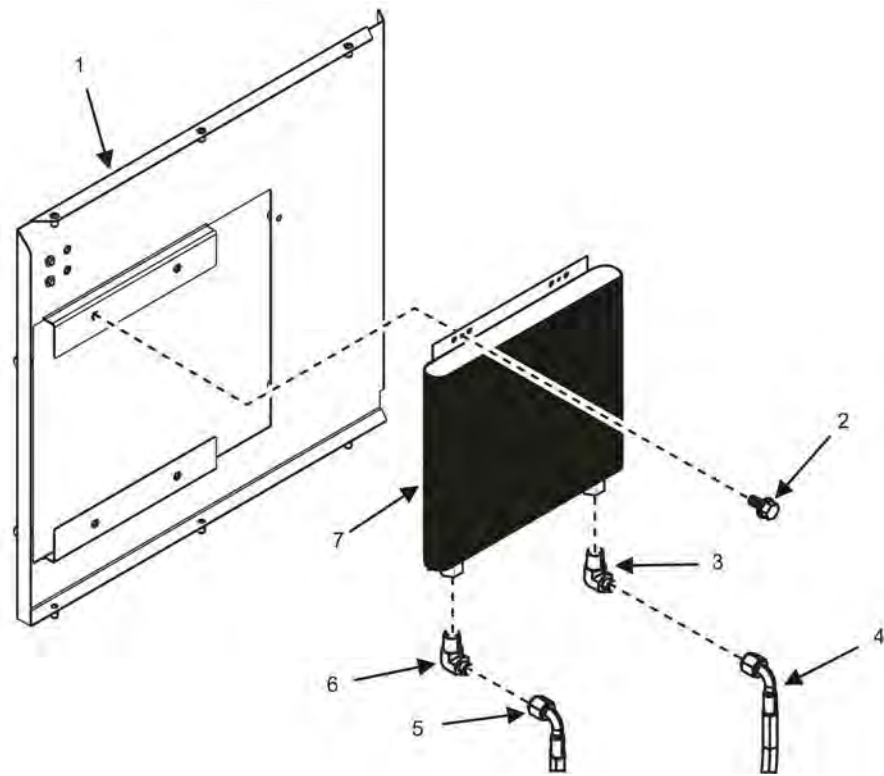
- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

## Remove Fuel Cooler



**Figure 1. Fuel Cooler — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate fuel cooler (Figure 1) mounted on interior panel.



**Figure 2. Fuel Cooler — Removal.**

3. Place suitable catch container and wiping rag under fuel cooler to capture spilled fuel.

### NOTE

Capture and dispose of spilled fuel IAW local SOP. Cap/plug open fuel lines to prevent dirt and debris from entering the fuel system.

Tag fuel lines for installation.

Two wrenches are required to separate fittings.

4. Tag and disconnect fuel return line (Figure 2, Item 5) from inlet elbow (Figure 2, Item 6) of fuel cooler (Figure 2, Item 7).
5. Tag and disconnect fuel line (Figure 2, Item 4) from outlet elbow (Figure 2, Item 3) of fuel cooler (Figure 2, Item 7).
6. Inspect fuel lines (Figure 2, Items 4 and 5) and outlet and inlet elbows (Figure 2, Items 3 and 6) for obvious signs of damage and replace as required.
7. Remove four screws (Figure 2, Item 2) securing fuel cooler (Figure 2, Item 7) to interior body panel (Figure 2, Item 1) while supporting fuel cooler (Figure 2, Item 7).
8. Remove fuel cooler (Figure 2, Item 7) from unit.
9. Remove inlet and outlet elbows (Figure 2, Items 3 and 6) from fuel cooler (Figure 2, Item 7).
10. Cap/plug holes in fuel cooler (Figure 2, Item 7) to prevent dirt and debris from entering the fuel system.

11. Place fuel cooler (Figure 2, Item 7) on suitable work surface.

**END OF TASK****Inspect Fuel Cooler**

1. Inspect fuel cooler (Figure 2, Item 7) for leaks, cracks, and other obvious signs of damage. Replace as required.
2. Inspect inlet and outlet elbows (Figure 2, Items 3 and 6) for cracks and other obvious signs of damage. Replace as required.

**END OF TASK****Install Fuel Cooler****NOTE**

Capture and dispose of spilled fluid IAW local SOP. Remove all caps/plugs from fuel lines/fittings prior to installation of each fuel line.

Identification tags should remain on fuel lines until unit is assembled and tested for proper operation.

Wipe down fuel lines, parts, and fittings with wiping rag prior to installation.

Sealant cure time is 30 min to use fuel system and 72 hr for full strength.

1. Apply sealant to inlet and outlet elbows (Figure 2, Items 3 and 6) threads prior to installation.
2. Install inlet and outlet elbows (Figure 2, Items 3 and 6) to left- and right-side of fuel cooler.
3. Position fuel cooler (Figure 2, Item 7) to mounting position on interior body panel (Figure 2, Item 1).
4. Secure fuel cooler (Figure 2, item 7) to interior body panel (Figure 2, Item 1) with four screws (Figure 2, Item 2). Tighten screws (Figure 2, Item 2) to 87 – 105 in/lb (10 – 12 Nm).
5. Install fuel return line (Figure 2, Item 5) to inlet elbow (Figure 2, Item 6) of fuel cooler (Figure 2, Item 7).
6. Install fuel line (Figure 2, Item 4) to outlet elbow (Figure 2, Item 3) of fuel cooler (Figure 2, Item 7).
7. Install top body panel (WP 0029, Remove/Install Top Body Panel).
8. Connect negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
9. Purge fuel system (WP 0044, Service Fuel System).
10. Close generator set doors.
11. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
12. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
13. Repair as required.

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL FUEL LEVEL SENSOR**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0179, Table 2, Item 40)

**Materials/Parts**

Seal, O-Ring (1) (WP 0117, Repair Parts List, Figure 12, Item 2)

Sensor, fuel level (1) (WP 0117, Figure 12, Item 3)

Washer, lock, EIT #10 (0117, Repair Parts List, Figure 12, Item 5)

Brush, acid swabbing (WP 0180, Expendable and Durable Items List, Item 5)

Cap set, protective (1) (WP 0180, Item 8)

Cleaning compound, solvent (WP 0180, Item 11)

Fuel, diesel, DF-2 (WP 0180, Item 21)

Grease, electrically conductive (WP 0180, Item 22)

Pan, drain (1) (WP 0180, Item 30)

**Materials/Parts**

Primer, sealing compound (WP 0180, Item 32)

Rag, wiping (2) (WP 0180, Item 33)

Sealant (WP 0180, Item 34)

**Personnel Required**

91D (1)

Assistant (1)

**References**

WP 0044, Service Fuel System

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

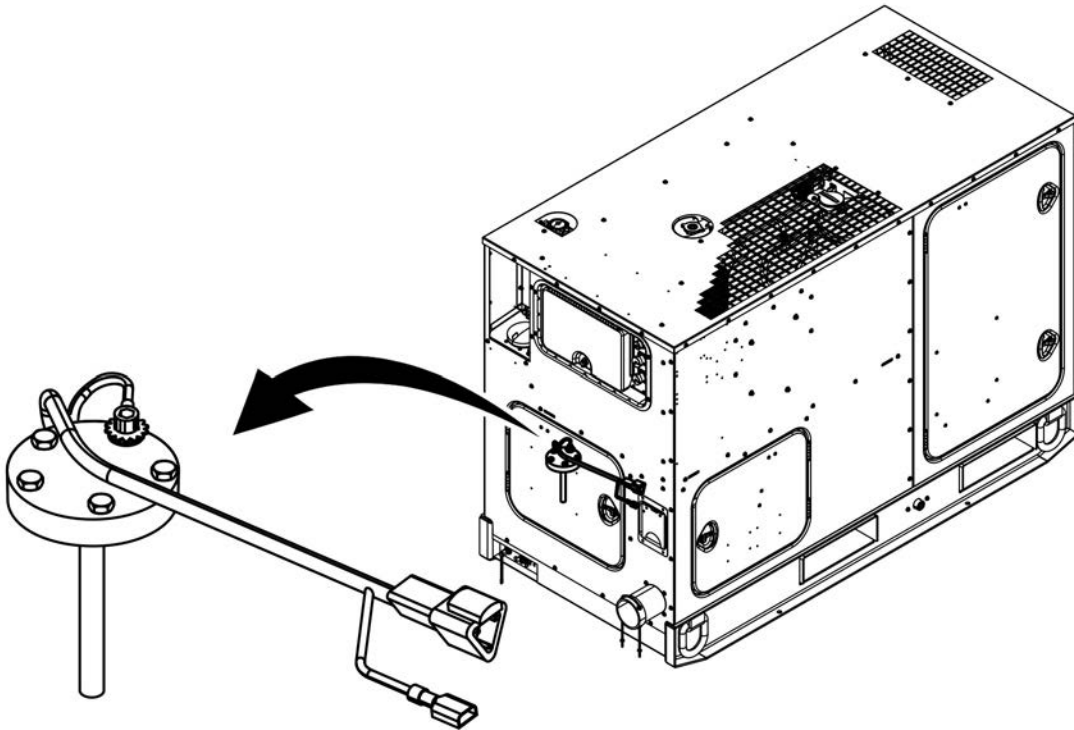
Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

**REMOVE/INSTALL FUEL LEVEL SENSOR****WARNING**

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.
- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

## Remove Fuel Level Sensor



**Figure 1. Fuel Level Sensor — Location.**

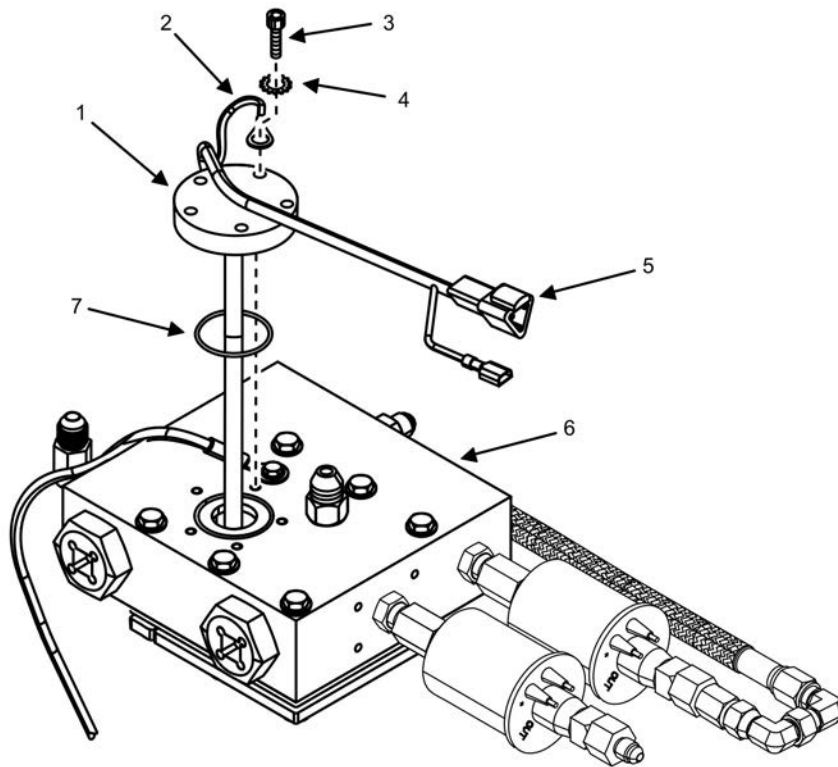
1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate fuel level sensor (Figure 1) on top of fuel manifold (Figure 2, Item 6).

### NOTE

Capture and dispose of spilled fuel IAW local SOP. Cap/plug all openings to prevent dirt and debris from entering the fuel system.

3. Remove dirt and debris from around fuel level sensor (Figure 2, Item 1).
4. Disconnect fuel level sensor (Figure 2, Item 1) electrical connectors (Figure 2, Item 5) from unit wiring harness connectors (not shown).





**Figure 2. Fuel Level Sensor — Detail.**

5. Remove five machine screws (Figure 2, Item 3), one external tooth lock washer (Figure 2, Item 4), and one ground wire (Figure 2, Item 2).
6. Discard external tooth lock washer (Figure 2, Item 4).

### NOTE

Note orientation of fuel level sensor (Figure 2, Item 1) prior to removal to aid in installation.

7. Remove fuel level sensor (Figure 2, Item 1) and O-ring (Figure 2, Item 7) from fuel manifold (Figure 2, Item 6).
8. Discard O-ring (Figure 2, Item 7).

### WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

9. Clean fuel manifold (Figure 2, Item 6) of any remaining O-ring residue using dry cleaning solvent and wiping rag.
10. Cover fuel manifold (Figure 2, Item 6) opening to prevent dirt and debris from entering fuel system.

**END OF TASK**

---

**Inspect Fuel Level Sensor**

1. Inspect fuel level sensor (Figure 2, Item 1) for cracks and other signs of obvious damage and replace as required.
2. Inspect electrical connectors (Figure 2, Item 5) for cut/broken wire or worn insulation. Replace fuel level sensor (Figure 2, Item 1) if wires are cut or broken or if insulation is excessively worn.

**END OF TASK****Install Fuel Level Sensor****NOTE**

Capture and dispose of spilled fuel IAW local SOP.

Wipe down fuel lines, manifold, and fittings with wiping rag prior to installation.

1. Remove all dirt, debris, and old gasket residue from fuel level sensor (Figure 2, Item 1) mounting area on fuel manifold (Figure 2, Item 4).
2. Lubricate new O-ring (Figure 2, Item 7) with clean diesel fuel and position on fuel tank manifold (Figure 2, Item 6).
3. Position fuel level sensor (Figure 2, Item 1) on fuel manifold (Figure 2, Item 6) and align mounting holes.
4. Ensure proper orientation of fuel level sensor (Figure 2, Item 1) on fuel manifold (Figure 2, Item 6).

**NOTE**

Follow all manufacturers' instructions for primer and sealant application.

One of the five machine screws (Figure 2, Item 3) also secures ground wire (Figure 2, Item 2) with one external tooth lock washer (Figure 2, Item 4).

5. Apply primer and sealant to five screws (Figure 2, Item 2).
6. Install five machine screws (Figure 2, Item 3), one external tooth lock washer (Figure 2, Item 4), and ground wire (Figure 2, Item 2).
7. Connect electrical connectors (Figure 2, Item 3) to unit wiring harness connectors (not shown).
8. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
9. Purge fuel system (WP 0044, Service Fuel System).
10. Dispose of spilled fuel IAW local SOP.
11. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
12. Start engine and check for proper operation (TM 9-6115-752-10).
13. Repair as required.

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL FUEL TANK**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0179, Table 2, Item 40)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Connector, hose, bulkhead (WP 0116, Repair Parts List, Figure 11, Item 34)

Gasket (WP 0116, Figure 11, Item 41)

Tank (WP 0116, Figure 11, Item 33)

Washer, sealing (6) (WP 0116, Figure 11, Item 40)

Alcohol, denatured (WP 0180, Expendable and Durable Items List, Item 1)

Cap set, protective (WP 0180, Item 8)

Detergent, general purpose (WP 0180, Item 18)

Distilled water (WP 0180, Item 19)

Fuel, diesel, DF-2 (WP 0180, Item 21)

Pan, drain (WP 0180, Item 30)

Rag, wiping (WP 0180, Item 33)

Sealant (WP 0180, Item 34)

**Personnel Required**

91D (1)

Assistant (1)

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

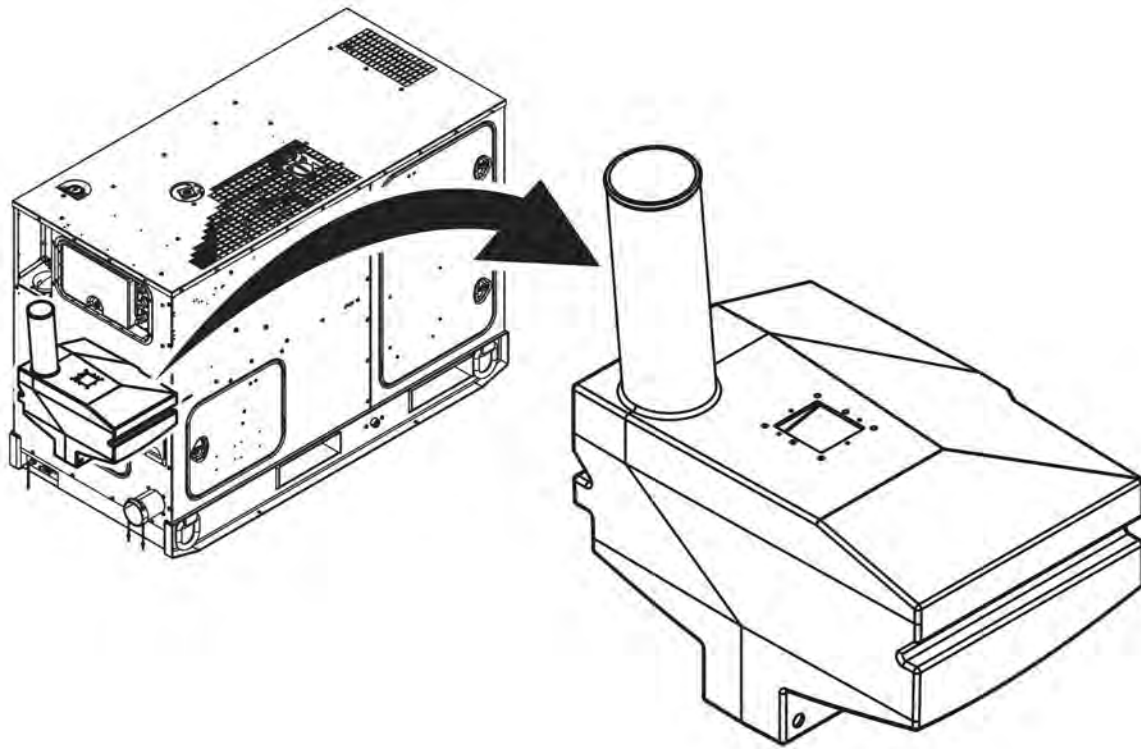
Battery ground cable removed (WP 0037, Remove/Install Batteries)

Interior body panels removed (WP 0034, Remove/Install Interior Body Panels)

Fuel tank drained (WP 0044, Service Fuel System)

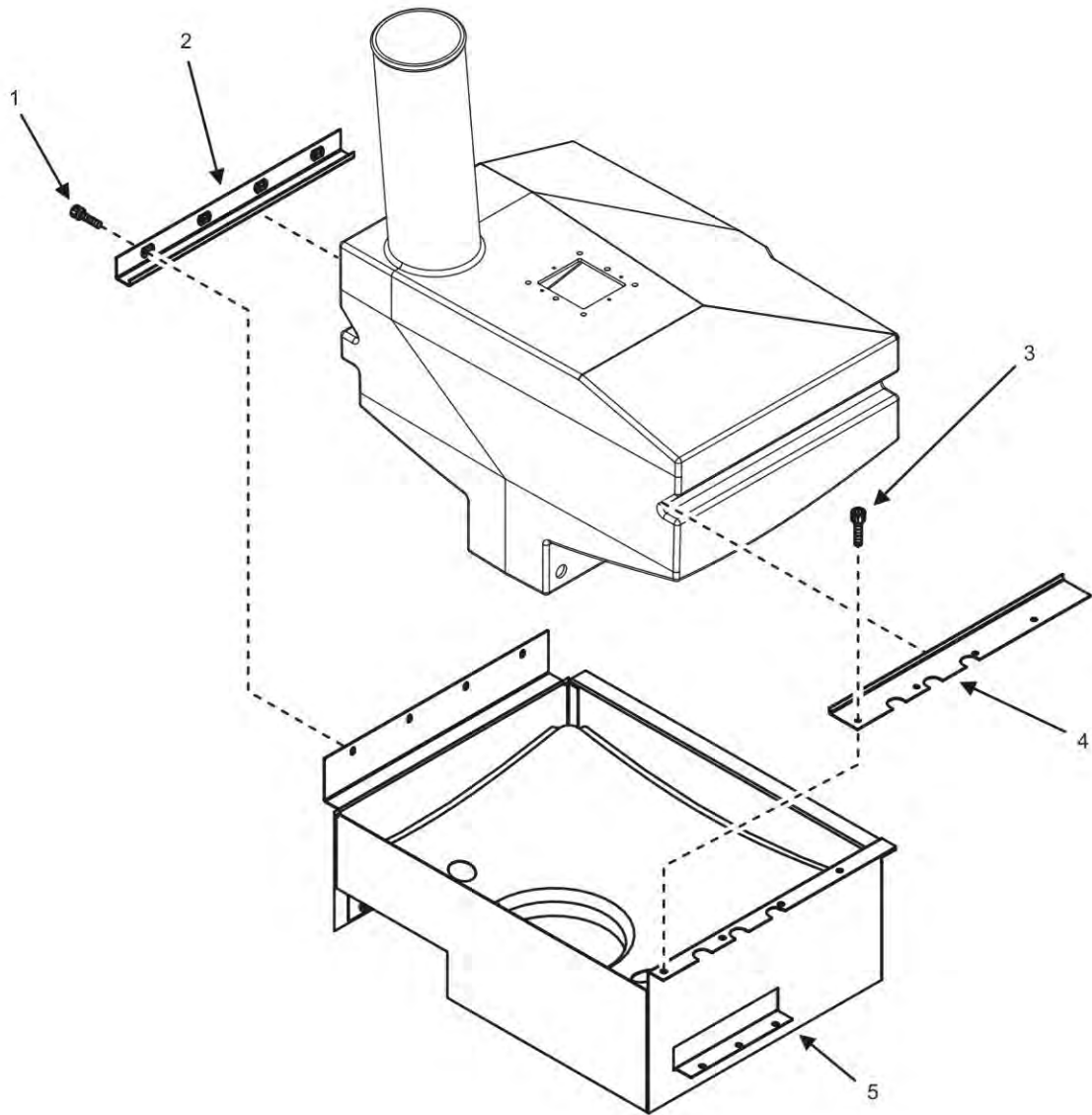
Fuel tank filler neck removed (WP 0054, Remove/Install Fuel Tank Filler Neck)

Fuel manifold removed (WP 0046, Replace Fuel Manifold)

**REMOVE/INSTALL FUEL TANK****Remove Fuel Tank**

**Figure 1. Fuel Tank — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate fuel tank (Figure 1).



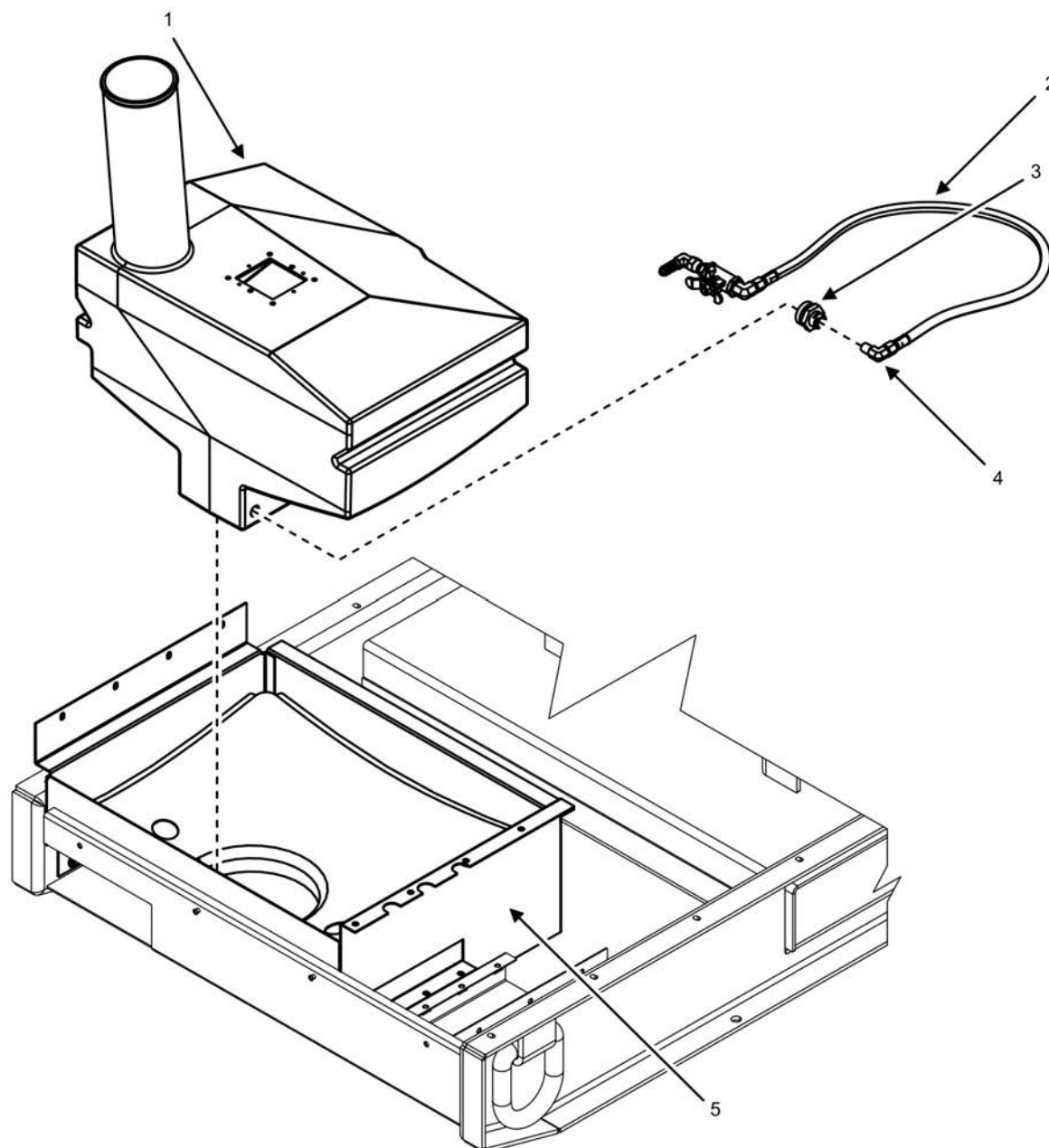
**Figure 2. Fuel Tank Mounting Brackets.**

**NOTE**

Capture spilled fuel and dispose of IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

3. Remove four screws (Figure 2, Item 1) securing left-side bracket (Figure 2, Item 2) to fuel tank support (Figure 2, Item 5).
4. Remove left-side bracket (Figure 2, Item 2) from unit.
5. Inspect left-side bracket (Figure 2, Item 2) for cracks and other signs of obvious damage. Replace as required.
6. Remove four screws (Figure 2, Item 3) securing right-side bracket (Figure 2, Item 4) to fuel tank support (Figure 2, Item 5).
7. Remove right-side bracket (Figure 2, Item 4) from unit.

8. Inspect right-side bracket (Figure 2, Item 4) for cracks and other signs of obvious damage. Replace as required.



**Figure 3. Fuel Tank — Removal.**

9. Lift fuel tank (Figure 3, Item 1) slightly with fuel drain line assembly (Figure 3, Item 2) attached from unit.
10. Loosen and remove tube elbow fitting (Figure 3, Item 4) on fuel drain line assembly (Figure 3, Item 2) at bulkhead fitting (Figure 3, Item 3) on fuel tank (Figure 3, Item 1). Leave fuel drain line assembly (Figure 3, Item 2) in unit.
11. Remove fuel tank (Figure 3, Item 1) from unit.

12. Inspect fuel tank support (Figure 3, Item 5) for damage and replace as required.
13. Inspect fuel drain line assembly (Figure 3, Item 2) for cracks, wear, and other signs of obvious damage. Replace as required.
14. Remove bulkhead fitting (Figure 3, Item 3) from fuel tank (Figure 3, Item 1). Discard bulkhead fitting (Figure 3, Item 3).

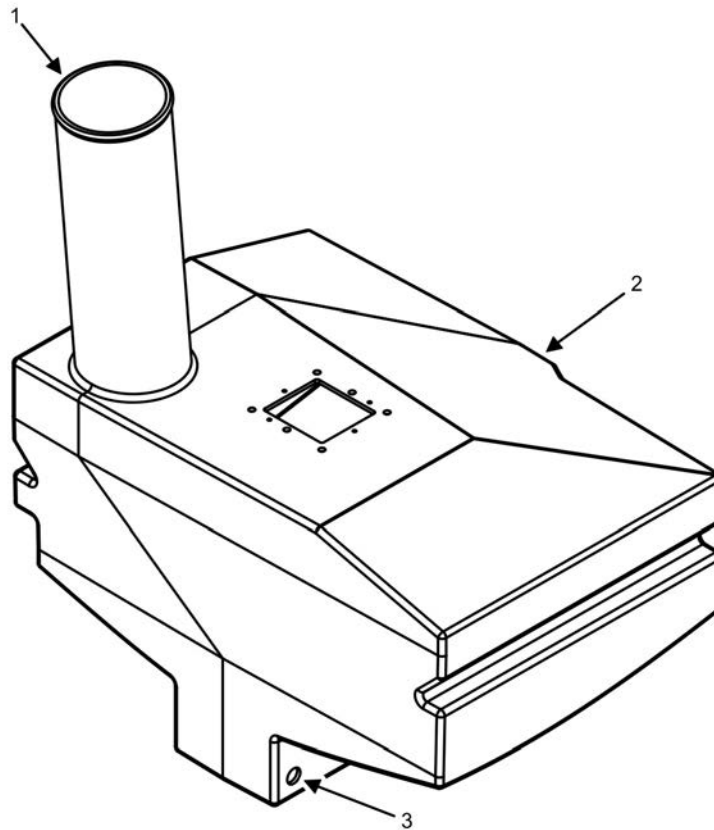
#### END OF TASK

#### Inspect Fuel Tank

1. Inspect fuel tank (Figure 3, Item 1) for damage, leaks, or cracks.
2. Replace fuel tank (Figure 3, Item 1) if damaged, leaking, or cracked.

#### END OF TASK

#### Clean Fuel Tank



**Figure 4. Clean Fuel Tank.**

1. Place drain pan under the fuel tank (Figure 4, Item 2).
2. Cap/plug fuel tank outlet (Figure 4, Item 3).
3. Drain residual fuel.

4. Fill the fuel tank (Figure 4, Item 2) to three-fourths capacity with solution of 16 oz general purpose detergent to 1 gal distilled water through the fuel filler neck opening (Figure 4, Item 1).
5. Agitate fuel tank (Figure 4, Item 2) manually for 10 min.
6. Turn fuel tank (Figure 4, Item 2) upside down and drain solution through fuel filler neck opening (Figure 4, Item 1).
7. Fill fuel tank (Figure 4, Item 2) to three-fourths full capacity with distilled water through fuel filler neck opening (Figure 4, Item 1).
8. Agitate fuel tank (Figure 4, Item 2) manually for 10 min.
9. Turn fuel tank (Figure 4, Item 2) upside down and drain water through fuel filler neck opening (Figure 4, Item 1).
10. Pour 16 oz denatured alcohol into fuel tank (Figure 4, Item 2) through fuel filler neck opening (Figure 4, Item 1).
11. Distribute alcohol over interior of fuel tank (Figure 4, Item 2) by manual rotation.
12. Remove cap/plug from fuel tank outlet (Figure 4, Item 3).
13. Drain any remaining alcohol through fuel tank outlet (Figure 4, Item 3).
14. Allow fuel tank (Figure 4, Item 2) to dry for 2 hr.

**END OF TASK****Install Fuel Tank****NOTE**

Capture spilled fuel and dispose of IAW local SOP. Remove all caps/plugs prior to installation.

Wipe down lines, parts, and fittings with wiping rag prior to installation.

1. Install new bulkhead fitting (Figure 3, Item 3) to fuel tank (Figure 3, Item 1).
2. Secure bulkhead fitting (Figure 3, Item 3) to torque value 35 – 44 in/lb (4 – 5 Nm).

**NOTE**

Pipe thread sealant cure time is 30 min to use fuel system and 72 hr for full strength.

3. Apply pipe thread sealant to tube elbow fitting (Figure 3, Item 4) of fuel drain line assembly (Figure 3, Item 2).

**NOTE**

When disconnected from fuel tank (Figure 3, Item 1), fuel tank drain valve assembly (Figure 3, Item 2) rests on the unit skid.

4. Locate fuel tank drain valve assembly (Figure 3, Item 2) in unit skid and pull assembly through fuel tank support (Figure 2, Item 5).
5. Install tube elbow fitting (Figure 3, Item 4) of fuel drain line assembly (Figure 3, Item 2) to bulkhead fitting (Figure 3, Item 3).
6. Position fuel tank (Figure 3, Item 1) into fuel tank support (Figure 3, Item 5).
7. Position left-side bracket (Figure 2, Item 2) over fuel tank (Figure 3, Item 1) and fuel tank support (Figure 2, Item 5).



8. Install four screws (Figure 2, Item 1) to secure left-side bracket (Figure 2, Item 2) to fuel tank support (Figure 2, Item 5).
9. Position right-side bracket (Figure 2, Item 4) over fuel tank (Figure 3, Item 1) and fuel tank support (Figure 2, Item 5).
10. Install four screws (Figure 2, Item 3) to secure right-side bracket (Figure 2, Item 4) to fuel tank support (Figure 2, Item 5).
11. Secure left- and right-side bracket screws (Figure 2, Items 1 and 3) to torque value 44 – 38 in/lb (5 – 6 Nm).
12. Install fuel manifold (WP 0046, Remove/Install Fuel Manifold).
13. Install fuel filler neck (WP 0054, Remove/Install Fuel Filler Neck).
14. Install radiator support panel (WP 0034, Remove/Install Interior Panels).
15. Install rear body panel (WP 0031, Remove/Install Rear Body Panel).
16. Install DCS (WP 0017, Remove/Install DCS).
17. Install top body panel (WP 0029, Remove/Install Top Body Panel).
18. Connect negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).

### **WARNING**

Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (fuel fill static ground). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate ESD. Failure to comply may cause injury or death to personnel.

19. Add a small amount of fuel to fuel tank for test after pipe thread sealant has cured (WP 0044, Service Fuel System).
20. Purge fuel system (WP 0044, Service Fuel System).
21. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
22. Start engine and check for fuel leaks and proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
23. Stop engine, repair any leaks, and then start engine again to check leak repairs. Repeat as needed until all leaks have been repaired.
24. Fill fuel tank to proper level (WP 0044, Service Fuel System).
25. Dispose of captured fuel and soiled wiping rags IAW local SOP.

### **END OF TASK**

### **END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL FUEL TANK DRAIN VALVE ASSEMBLY**

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**INITIAL SETUP:****Tools and Special Tools**

Crowfoot Attachment Set, Socket Wrench, Flare Nut, Standard (WP 0179, Table 2, Item 10)

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0179, Table 2, Item 39)

**Materials/Parts**

Adaptor, coupling 1/4 NPFT to 1/2 inch (1) (WP 0116, Repair Parts List, Figure 11, Item 49)

Connector, bulkhead 1/2-20 inch male (1) (WP 0116, Figure 11, Item 50)

Connector, hose, bulkhead (WP 0116, Figure 11, Item 34)

Fitting, tube elbow 1/2 inch to 1/4 NPT (2) (WP 0116, Figure 11, Item 44)

Line, fuel (WP 0116, Figure 11, Item 51)

Valve, ball (WP 0116, Figure 11, Item 45)

Cap set, protective (WP 0180, Expendable and Durable Items List, Item 8)

Fuel, diesel, DF-2 (WP 0180, Item 21)

Grease, electrically conductive (WP 0180, Item 22)

**Materials/Parts**

Pan, drain (WP 0180, Item 30)

Rag, wiping (4) (WP 0180, Item 33)

Sealant (WP 0180, Item 34)

**Personnel Required**

91D (1)

Assistant (1)

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

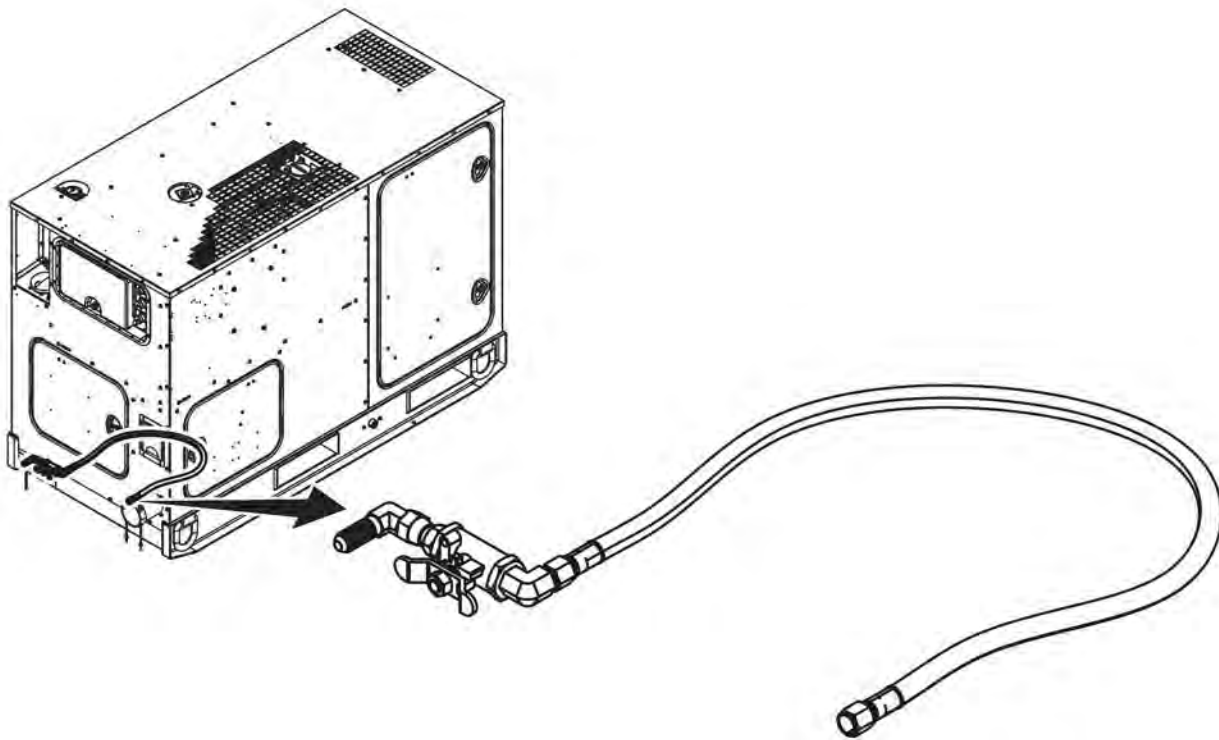
Fuel tank removed (WP 0052, Remove/Install Fuel Tank)

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**REMOVE/INSTALL FUEL TANK DRAIN VALVE ASSEMBLY**
**WARNING**

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

## Remove Fuel Tank Drain Valve Assembly



**Figure 1. Fuel Tank Drain Valve — Location.**

### NOTE

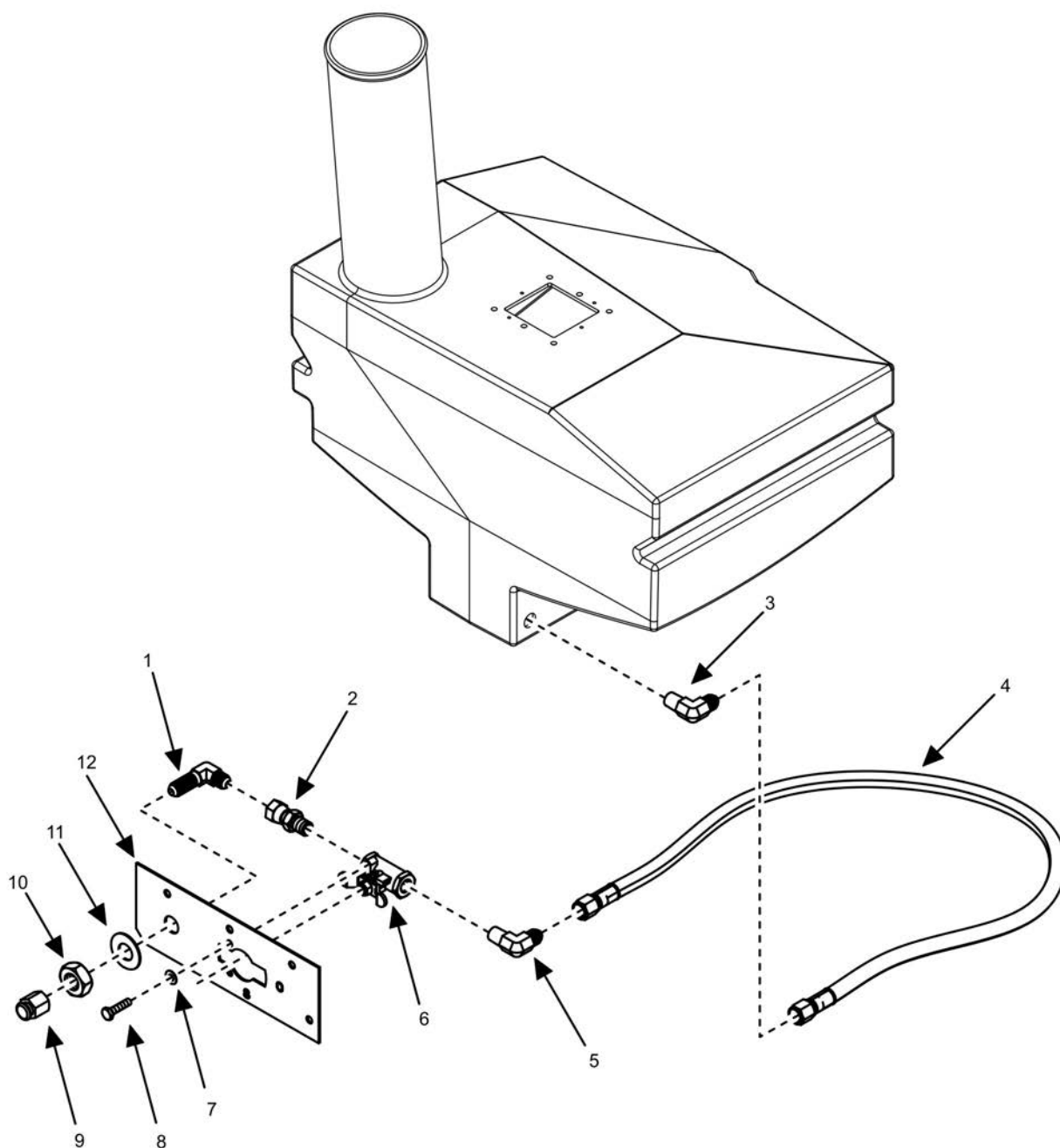
Removal of the fuel tank requires the disconnection of the fuel tank drain valve assembly from the fuel tank at tube elbow fitting and bulkhead fitting. Fuel tank must be removed and disconnected from fuel tank drain valve assembly prior to beginning this task.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate fuel tank drain valve assembly (Figure 1).
3. Remove any dirt and debris from around bulkhead connector (Figure 2, Item 1) and fuel drain cap (Figure 2, Item 9).

### NOTE

Capture and dispose of spilled fuel IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

4. Remove fuel drain cap (Figure 2, Item 9) from bulkhead connector (Figure 2, Item 1).



**Figure 2. Fuel Tank Drain Valve — Detail.**

**NOTE**

Note orientation of tube elbow fittings (Figure 2, Items 3 and 5) and ball valve (Figure 2, Item 6) before removal to aid in installation.

5. Remove nut (Figure 2, Item 10) and flat washer (Figure 2, Item 11) securing bulkhead connector (Figure 2, Item 1) to rear of skid.

6. Remove two screws (Figure 2, Item 8) and washers (Figure 2, Item 7) securing ball valve (Figure 2, Item 6) to ball valve plate (Figure 2, Item 12).
7. Open ball valve lever to slide ball valve (Figure 2, Item 6) through opening of ball valve plate (Figure 2, Item 12).
8. Remove fuel drain assembly (Figure 1) from unit and place on suitable work surface.
9. Disconnect bulkhead connector (Figure 2, Item 1) from assembly at coupling adaptor (Figure 2, Item 2).
10. Disconnect coupling adaptor (Figure 2, Item 2) from assembly at ball valve (Figure 2, Item 6).
11. Disconnect ball valve (Figure 2, Item 6) from assembly at tube elbow fitting (Figure 2, Item 5).
12. Disconnect tube elbow fitting (Figure 2, Item 5) from assembly at fuel line (Figure 2, Item 4).
13. Disconnect fuel line (Figure 2, Item 4) from tube elbow fitting (Figure 2, Item 3).
14. Place fuel drain assembly parts on suitable work surface.

## END OF TASK

### Inspect Fuel Tank Drain Valve Assembly

1. Inspect tube elbow fittings (Figure 2, Items 3 and 5) for cracks, worn threads, excessive corrosion, and other signs of obvious damage. Replace tube elbow fittings (Figure 2, Items 3 and 5) as required.
2. Inspect fuel line (Figure 2, Item 4) for frayed cover, cracks, kinks, and other signs of obvious damage. Replace fuel line (Figure 2, Item 4) as required.
3. Inspect ball valve (Figure 2, Item 6) for cracks, broken/damaged handle, restricted handle movement, excessive corrosion, and other signs of obvious damage. Replace ball valve (Figure 2, Item 6) as required.
4. Inspect coupling adaptor (Figure 2, Item 2) for worn threads, excessive corrosion, cracks, and other signs of obvious damage. Replace coupling adaptor (Figure 2, Item 2) as required.
5. Inspect bulkhead connector (Figure 2, Item 1) for worn threads, excessive corrosion, cracks, and other signs of obvious damage. Replace bulkhead connector (Figure 2, Item 1) as required.
6. Inspect flat washer (Figure 2, Item 11) for dents, cracks, and other signs of obvious damage. Replace flat washer (Figure 2, Item 11) as required.
7. Inspect nut (Figure 2, Item 10) for worn threads, excessive corrosion, and other signs of obvious damage. Replace nut (Figure 2, Item 10) as required.
8. Inspect fuel drain cap (Figure 2, Item 9) and chain (not shown) for cracks, excessive corrosion, and other signs of obvious damage. Replace as required.
9. Inspect bulkhead fitting (on tank) for worn threads, excessive corrosion, and other signs of obvious damage. Replace as required.

## END OF TASK

### Install Fuel Tank Drain Valve Assembly

## NOTE

Wipe down fuel lines, parts, and fittings with wiping rag prior to installation.

Thread pipe sealant must cure for 30 min before exposure to fuel and 72 hr for full strength.

1. Apply thread pipe sealant to threads of tube elbow fitting (Figure 2, Item 3).
2. Connect tube elbow fitting (Figure 2, Item 3) to fuel line (Figure 2, Item 4).

3. Apply thread pipe sealant to threads of tube elbow fitting (Figure 2, Item 5).
4. Connect tube elbow fitting (Figure 2, Item 5) to assembly at fuel line (Figure 2, Item 4).
5. Tighten fuel line (Figure 2, Item 4) fittings to 195 – 212 in/lb (22 – 24 Nm).
6. Connect ball valve (Figure 2, Item 6) to assembly at tube elbow fitting (Figure 2, Item 5).
7. Apply thread pipe sealant to threads of coupling adaptor (Figure 2, Item 2).
8. Connect coupling adaptor (Figure 2, Item 2) to assembly at ball valve (Figure 2, Item 6).
9. Connect bulkhead connector (Figure 2, Item 1) to assembly at coupling adaptor (Figure 2, Item 2).
10. Insert bulkhead connector (Figure 2, Item 1) through skid.
11. Insert ball valve (Figure 2, Item 6) through skid/ball valve mounting plate.
12. Install two screws (Figure 2, Item 8) and washers (Figure 2, Item 7) to secure ball valve (Figure 2, Item 6) to ball valve plate (Figure 2, Item 12).
13. Tighten screws (Figure 2, Item 8) to 25 – 30 in/lb (3 Nm).
14. Install flat washer (Figure 2, Item 11) and nut (Figure 2, Item 10) to bulkhead connector (Figure 2, Item 1).
15. Tighten nut (Figure 2, Item 10) to 195 – 212 in/lb (22 – 24 Nm).
16. Install fuel drain cap (Figure 2, Item 9) to bulkhead connector (Figure 2, Item 1).
17. Ensure ball valve (Figure 2, Item 6) is in closed position (handle perpendicular to body of valve).

### NOTE

Installation of the fuel tank connects the fuel tank drain valve assembly to the fuel tank at tube elbow fitting (Figure 2, Item 3) and bulkhead fitting (on tank). Fuel tank must be installed and connected to fuel tank drain valve assembly for complete reassembly.

18. Install fuel tank (WP 0052, Remove/Install Fuel Tank).
19. Add fuel once pipe thread compound has set (WP 0044, Service Fuel System).
20. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
21. Purge fuel system (WP 0044, Service Fuel System).
22. Close generator set doors.
23. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
24. Start engine and check for fuel leaks and proper operation (TM 9-6115-752-10).
25. Repair as required
26. Dispose of captured fuel and soiled cleaning rags IAW local SOP.

**END OF TASK**

**END OF WORK PACKAGE**





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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL FUEL TANK FILLER NECK**

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**INITIAL SETUP:****Tools and Special Tools**

Crowfoot Attachment Set, Socket Wrench, Flare Nut, Standard (WP 0179, Table 2, Item 10)

Hammer, Hand, Soft Face, Dead Blow (WP 0179, Table 2, Item 12)

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0179, Table 2, Item 39)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0179, Table 2, Item 40)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Module, fuel filler (WP 0116, Repair Parts List, Figure 11, Item 22)

Washer, lock M10 (WP 0116, Figure 11, Item 25)

Cap set, protective (WP 0180, Expendable and Durable Items List, Item 8)

Fuel, diesel, DF-2 (WP 0180, Item 21)

Pan, drain (WP 0180, Item 30)

**Materials/Parts**

Rag, wiping (4) (WP 0180, Item 33)

Tag, marker (WP 0180, Item 37)

**Personnel Required**

91D (1)

Assistant (1)

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Fuel tank drained to half-capacity (WP 0044, Service Fuel System)

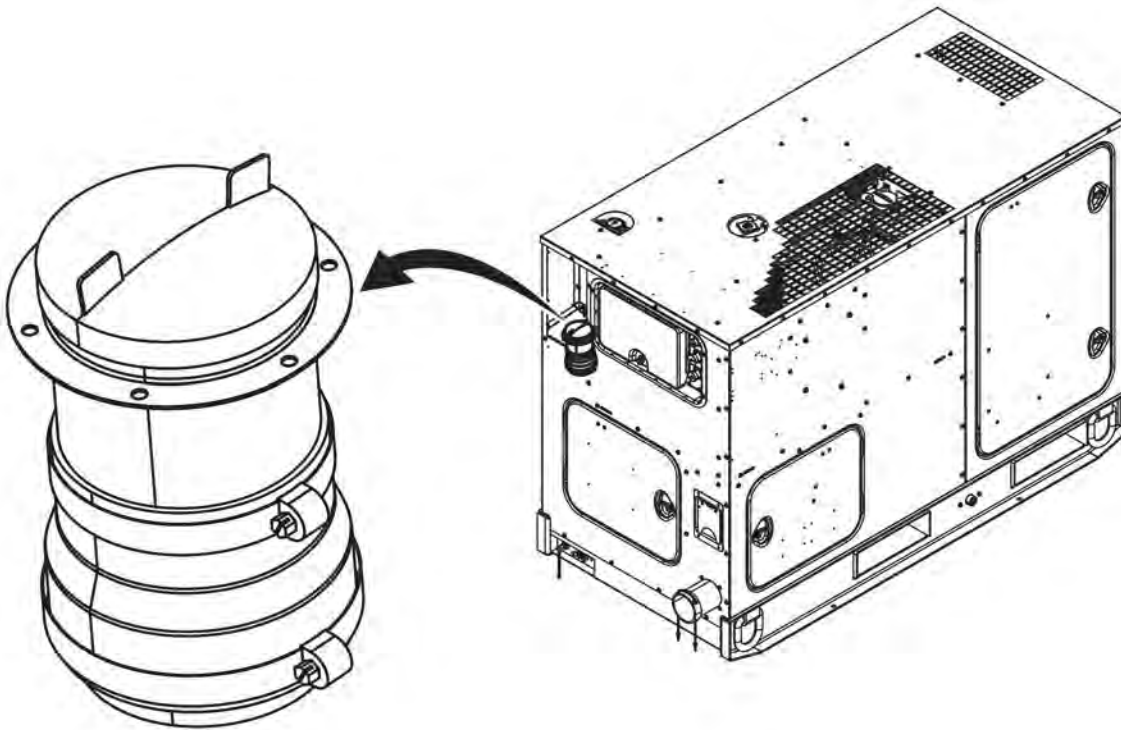
Top body panel removed (WP 0029, Remove/Install Top Body Panel)

Rear body panel removed (WP 0031, Remove/Install Rear Body Panel)

**REMOVE/INSTALL FUEL TANK FILLER NECK****WARNING**

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

## Remove Fuel Tank Filler Neck



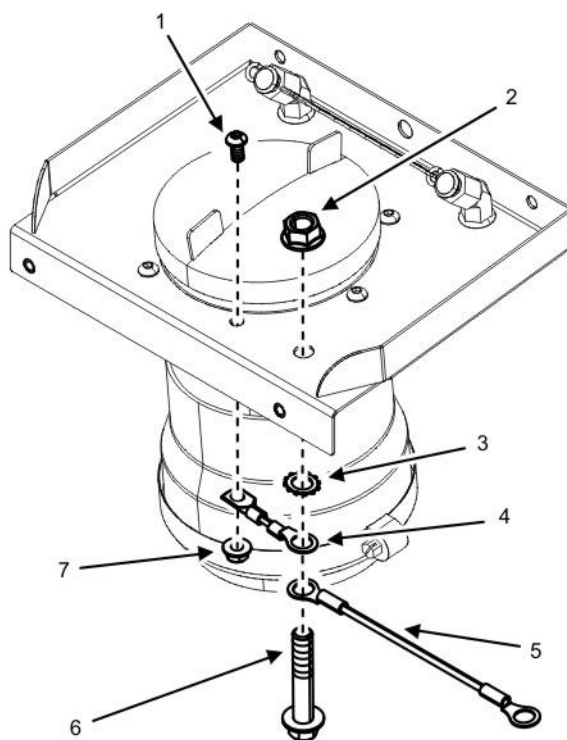
**Figure 1. Fuel Tank Filler Neck — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.

### **NOTE**

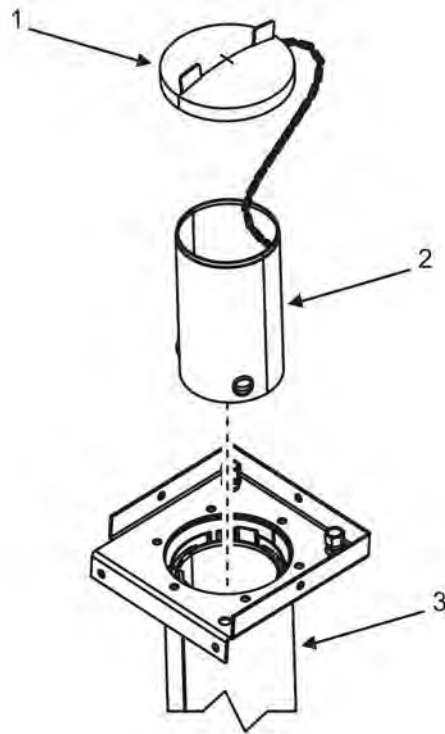
Note orientation of fuel cap before removal to aid in installation.

2. Locate fuel tank filler neck on top of fuel tank (Figure 1).



**Figure 2. Fuel Tank Filler Neck Ground Cable — Removal.**

3. Remove bolt (Figure 2, Item 6), external tooth lock washer (Figure 2, Item 3), and nut (Figure 2, Item 2) that secure ground cables (Figure 2, Items 4 and 5) to fuel system bracket (Figure 4, Item 2).
4. Discard external tooth lock washer (Figure 2, Item 3).



**Figure 3. Fuel Cap and Strainer — Removal.**

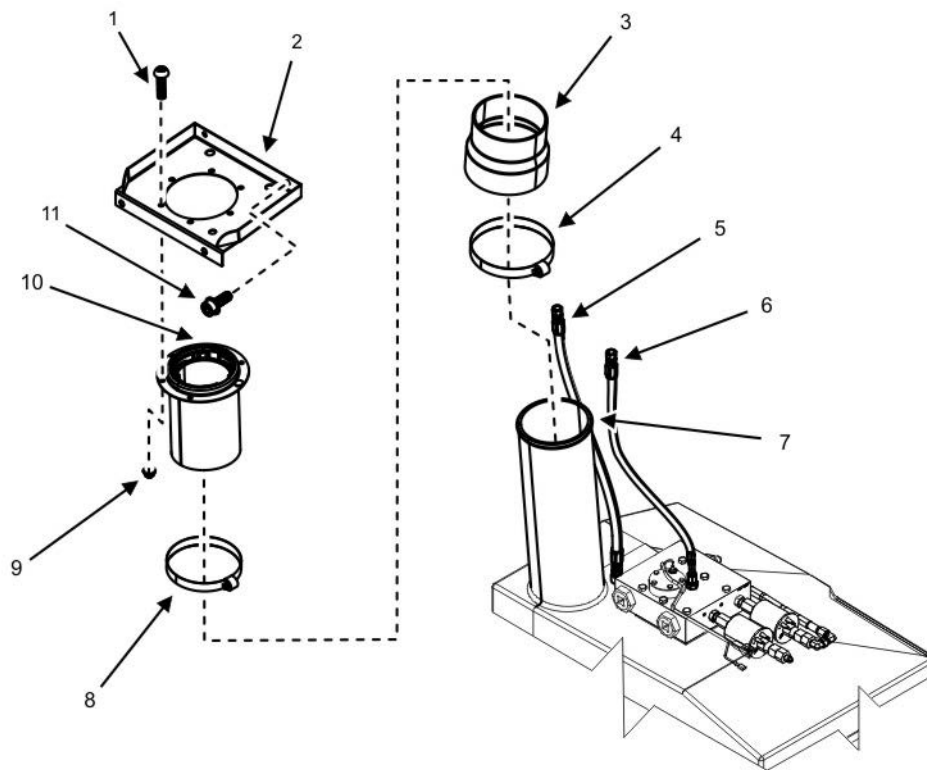
5. Remove fuel filler cap (Figure 3, Item 1) and strainer (Figure 3, Item 2) from fuel tank filler neck (Figure, Item 3).
6. Inspect fuel filler cap (Figure 3, Item 1) and chain for damage and replace as required.
7. Inspect strainer (Figure 3, Item 2) for damage and replace as required.
8. Cover opening in fuel tank filler neck (Figure 3, Item 3) to prevent dirt and debris from entering fuel system.
9. Remove two screws (Figure 4, Item 11) securing edges of fuel system bracket (Figure 4, Item 2) to interior panels of generator set.
10. Loosen and slide hose clamps (Figure 4, Items 4 and 8) and fuel tank collar (Figure 4, Item 3) away from fuel tank opening (Figure 4, Item 7).

### NOTE

Chains for the auxiliary fuel line caps (not shown) are secured by two of the six cap screws (Figure 4, Item 1) securing the fuel system bracket (Figure 4, Item 2) to the fuel tank filler neck (Figure 4, Item 10). Note the location of chains to aid in installation.

One of the six screws (Figure 2, Item 1) securing fuel tank filler neck (Figure 4, Item 10) to fuel system bracket (Figure 4, Item 2) also secures ground cable (Figure 2, Item 4) to fuel system bracket (Figure 4, Item 2).

11. Remove screw (Figure 2, Item 1) and nut (Figure 2, Item 7) that secure ground cable (Figure 2, Item 4) to fuel system bracket (Figure 4, Item 2).
12. Remove five remaining cap screws (Figure 4, Item 1) and nuts (Figure 4, Item 9) securing fuel system bracket (Figure 4, Item 2) to fuel tank filler neck (Figure 4, Item 10) and set aside for reuse.



**Figure 4. Fuel Tank Filler Neck — Detail.**

13. Reposition bracket to gain access to auxiliary fuel intake line and auxiliary fuel vent line.

### NOTE

Two wrenches may be required to disconnect the auxiliary fuel lines. Tag and mark the lines for proper reinstallation.

Capture and dispose of spilled fuel IAW local SOP. Cap/plug all open fuel lines/fittings to prevent dirt and debris from entering the fuel system.

14. Disconnect auxiliary fuel intake line (Figure 4, Item 5) from fuel system bracket (Figure 4, Item 2). Cap/plug line to prevent dirt and debris from entering fuel system.
15. Disconnect auxiliary vent line (Figure 4, Item 6) from fuel system bracket (Figure 4, Item 2). Cap/plug line to prevent dirt and debris from entering fuel system.
16. Remove fuel system bracket (Figure 4, Item 2) from unit and place on a suitable work surface.

**NOTE**

The fuel tank filler neck (Figure 4, Item 10) fits snugly over the fuel tank opening (Figure 4, Item 7). Light percussion from a rubber mallet will assist with the removal of the fuel tank filler neck (Figure 4, Item 10).

17. Remove fuel tank filler neck (Figure 4, Item 10), hose clamps (Figure 4, Items 4 and 8), and fuel tank collar (Figure 4, Item 3) from unit.
18. Remove hose clamps (Figure 4, Items 4 and 8) and fuel tank collar (Figure 4, Item 3) from fuel tank filler neck (Figure 4, Item 10).

**END OF TASK****Inspect Fuel Tank Filler Neck**

1. Inspect fuel tank filler neck (Figure 4, Item 10) for splits, cracks, or brittleness. Replace as required.
2. Inspect fuel tank collar (Figure 4, Item 3) for splits, cracks, or brittleness that would allow fuel to escape. Replace as required.
3. Inspect hose clamps (Figure 4, Items 4 and 8) for damage or corrosion. Replace as required.
4. Inspect fuel system bracket (Figure 4, Item 2) for damage or corrosion. Replace as required.

**END OF TASK****Install Fuel Tank Filler Neck****NOTE**

Capture and dispose of spilled fuel IAW local SOP. Remove all caps/plugs and tags from fuel lines/fittings prior to installation of each fuel line.

Wipe down fuel lines, parts, and fittings with wiping rag prior to installation.

1. Position top and bottom hose clamps (Figure 4, Items 4 and 8) to fuel tank collar (Figure 4, Item 3).
2. Slide fuel tank collar (Figure 4, Item 3) and hose clamps (Figure 4, Items 4 and 8) onto fuel tank filler neck (Figure 4, Item 10).

**NOTE**

The fuel tank filler neck (Figure 4, Item 10) snugly fits over the fuel tank opening (Figure 4, Item 7). Light percussion from a rubber mallet will assist with positioning the fuel tank filler neck (Figure 4, Item 10).

3. Install fuel tank collar (Figure 4, Item 3), hose clamps (Figure 4, Items 4 and 8), and fuel tank filler neck (Figure 4, Item 10) assembly to top of fuel tank opening (Figure 4, Item 7).
4. Position hose clamps (Figure 4, Items 4 and 8) on fuel tank collar (Figure 4, Item 3).
5. Connect auxiliary fuel intake line (Figure 4, Item 5) to fuel system bracket (Figure 4, Item 2).
6. Connect auxiliary vent line (Figure 4, Item 6) to fuel system bracket (Figure 4, Item 2).
7. Tighten auxiliary fuel intake line and auxiliary fuel vent line to 195 – 212 in/lb (22 – 24 Nm).
8. Position fuel system bracket (Figure 4, Item 2) over fuel tank filler neck (Figure 4, Item 10).

9. Install ground cable (Figure 2, Item 4) to fuel system bracket (Figure 4, Item 2) and fuel tank filler neck (Figure 4, Item 10) with screw (Figure 2, Item 1) and nut (Figure 2, Item 7).

### NOTE

Chains for the auxiliary fuel line caps (not shown) are secured by two of the six cap screws (Figure 4, Item 1) securing the fuel system bracket (Figure 4, Item 2) to the fuel tank filler neck (Figure 4, Item 10). Chains must be secured to the same location as removed before tightening screws (Figure 4, Item 1).

One of the six screws (Figure 2, Item 1) and nuts (Figure 2, Item 7) securing fuel tank filler neck (Figure 4, Item 10) to fuel system bracket (Figure 4, Item 2) was installed in step 9 to secure ground cable (Figure 2, Item 4) to fuel system bracket (Figure 4, Item 2).

10. Install fuel system bracket (Figure 4, Item 2) to fuel tank filler neck (Figure 4, Item 10) with remaining five cap screws (Figure 4, Item 1) and nuts (Figure 4, Item 9). Tighten six cap screws (Figure 4, Item 1) to a torque value of 89 – 106 in/lb (10 – 12 Nm).
11. Install two screws (Figure 4, Item 11) to secure edges of fuel system bracket (Figure 4, Item 2) to interior panel of generator set.
12. Secure fuel tank filler neck (Figure 4, Item 10) to fuel tank opening (Figure 4, Item 7) by tightening hose clamps (Figure 4, Items 4 and 8) to 27 in/lb (3 Nm).
13. Install strainer (Figure 3, Item 2).
14. Install fuel filler cap (Figure 3, Item 1).
15. Secure ground cables (Figure 2, Items 4 and 5) to fuel system bracket (Figure 4, Item 2) by installing bolt (Figure 2, Item 6), new external tooth lock washer (Figure 2, Item 3), and nut (Figure 2, Item 2).
16. Tighten bolt (Figure 2, Item 6) to 33 – 42 ft/lb (45 – 57 Nm).
17. Install rear body panel to generator set (WP 0031, Remove/Install Rear Body Panel).
18. Install DCS (WP 0017, Remove/Install DCS).
19. Install top body panel (WP 0029, Remove/Install Top Body Panel).
20. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
21. Purge fuel system (WP 0044, Service Fuel System).
22. Fill fuel tank to proper level (TM 9-6115-752-10).
23. Dispose of captured fuel IAW local SOP.
24. Close generator set doors.
25. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
26. Start engine and check for proper operation (TM 9-6115-752-10).
27. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**





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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL 50/60 HZ AC GENERATOR ASSEMBLY**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 FT-LB (WP 0179, Table 2, Item 38)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0179, Table 2, Item 39)

**Materials/Parts**

Generator, assembly, 30 kW, 50/60 Hz (WP 0129, Repair Parts List, Figure 24, Item 1)

Cable, tie (2) (WP 0129, Figure 24, Item 38)

Isolator, vibration (2) (WP 0128, Repair Parts List, Figure 23, Item 4)

Nut, self-locking, hex head (2) (WP 0128, Figure 23, Item 6)

Washer, lock (WP 0129, Figure 24, Item 8)

Washer, lock, external tooth (WP 0170, Repair Parts List, Figure 65, Item 109)

Antifreeze, ethylene glycol (WP 0180, Expendable and Durable Items List, Item 2)

Cap set, protective (WP 0180, Item 8)

Cleaning compound, solvent (WP 0180, Item 11)

Compound, antiseize (WP 0180, Item 14)

Distilled water (WP 0180, Item 19)

Grease, electrically conductive (WP 0180, Item 22)

Pan, drain (WP 0180, Item 30)

Penetrating oil (WP 0180, Item 31)

Rag, wiping (WP 0180, Item 33)

Tag, marker (WP 0180, Item 37)

**Personnel Required**

91D (1)

Assistant (2)

**References**

WP 0060, Remove/Install Voltage Selection Board

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Top body panel removed (WP 0029, Remove/Install Top Body Panel).

DCS removed (WP 0017, Remove/Install DCS)

Front body panel removed (WP 0030, Remove/Install Front Body Panel)

Rear body panel removed (WP 0031, Remove/Install Rear Body Panel)

Right-side body panel removed (WP 0033, Remove/Install Right-side Body Panel)

Left-side body panel removed (WP 0032, Remove/Install Left-side Body Panel)

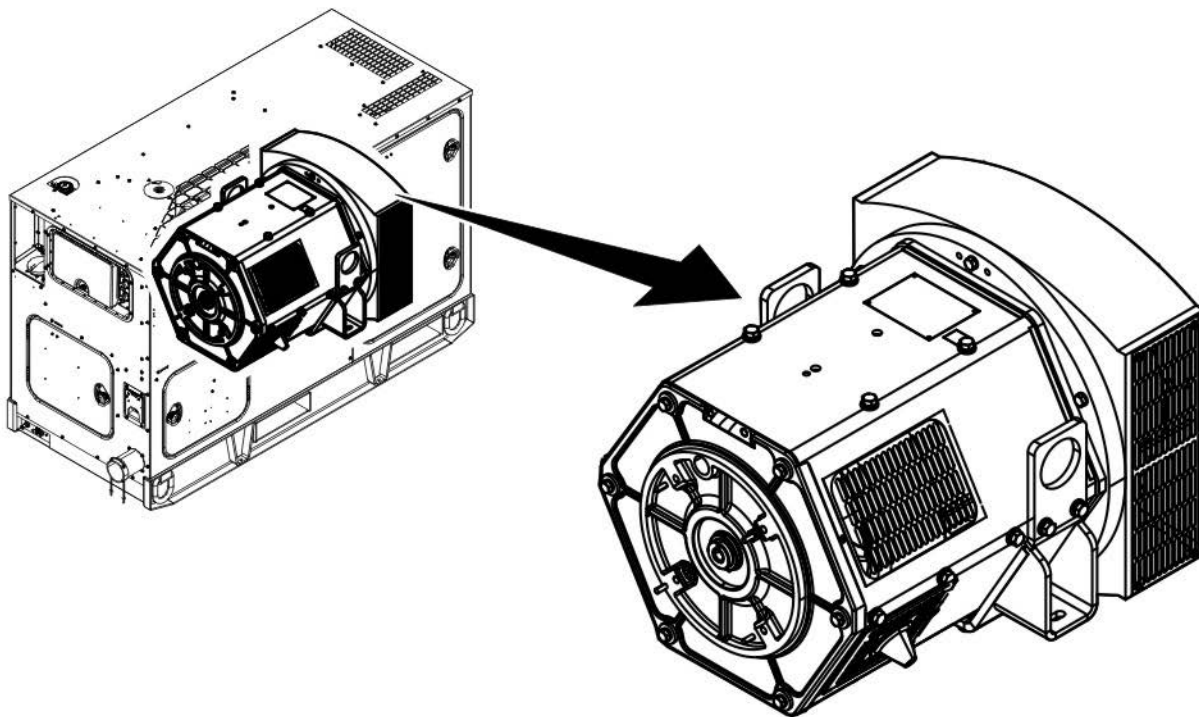
Interior bulkhead panel removed (WP 0034, Remove/Install Interior Body Panels)

Starter removed (WP 0078, Remove/Install Starter)

Fuel tank removed (WP 0052, Remove/Install Fuel Tank)

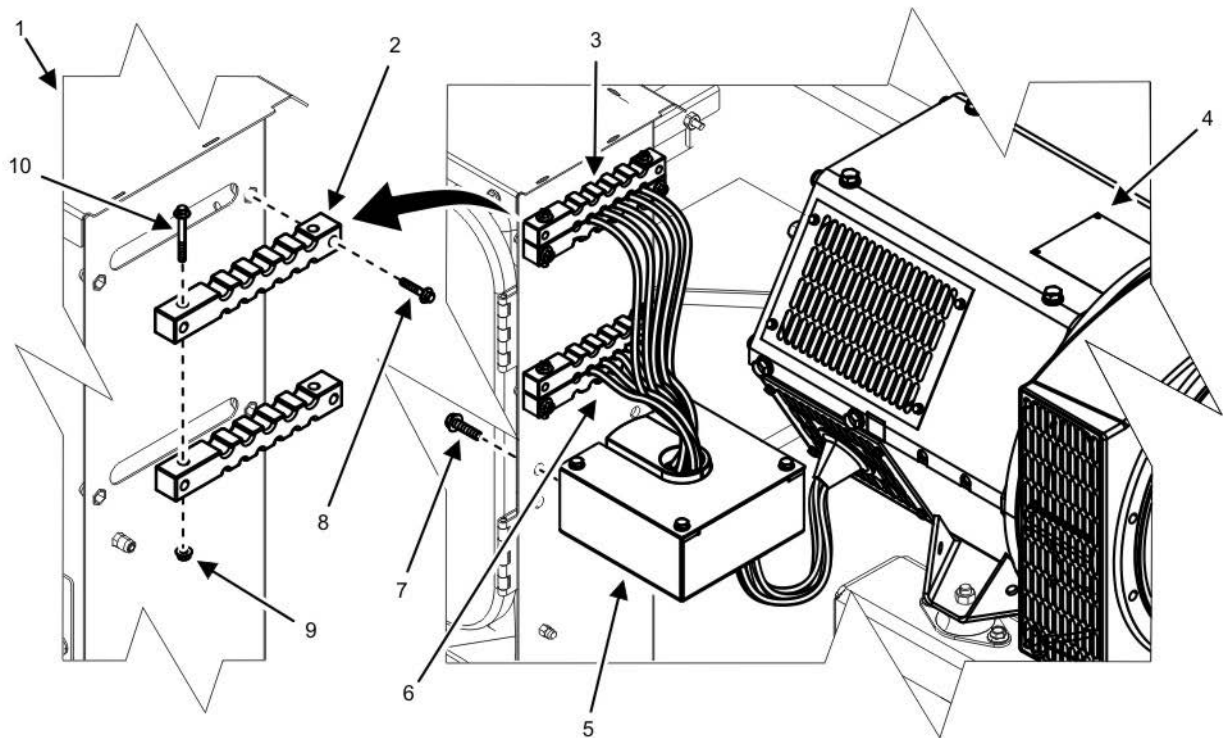
**REMOVE/INSTALL 50/60 HZ AC GENERATOR ASSEMBLY****WARNING**

- AC generator assembly weighs approximately 800 – 930 lb (362.9 – 421.8 kg). Use suitable lifting device with a capacity of at least 1,500 lb (680.4 kg). Do not stand or put arms, legs, or any body part under hoisted load. Failure to comply may cause injury or death to personnel.
- Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

**Remove 50/60 Hz AC Generator Assembly (UOC 98L)**

**Figure 1. 50/60 Hz AC Generator — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate AC generator (Figure 1).



**Figure 2. 50/60 Hz AC Generator Wiring — Removal.**

3. Remove four screws (Figure 2, Item 7) securing Electromagnetic Interference (EMI) filter (Figure 2, Item 5) to the output box (Figure 2, Item 1).
4. Remove four screws (Figure 2, Item 8) and two finger retainer assemblies (Figure 2, Item 3) from front edge of output box (Figure 2, Item 1).
5. Remove two screws (Figure 2, Item 10), two nuts (Figure 2, Item 9), and two finger retainers assemblies (Figure 2, Item 2) from six wire leads (Figure 2, Item 6).
6. Repeat step 5 to remove the second finger retainer assembly (Figure 2, Item 3) from the remaining five wire leads (Figure 2, Item 6).

### NOTE

To assist during installation, tag all electrical wires and connectors prior to removal.

7. Tag and remove 10 wire leads (Figure 2, Item 6) at voltage selection board in output box (Figure 2, Item 1) (WP 0060, Remove/Install Voltage Selection Board).
8. Remove four screws (Figure 3, Item 4), one screw (Figure 3, Item 3), and one nut (Figure 3, Item 2) that attach output box (Figure 3, Item 1) to skid.
9. Lift output box (Figure 3, Item 1) out of skid and place next to skid.
10. Remove screw (Figure 4, Item 5), lock washer (Figure 4, Item 2), lock washer (Figure 4, Item 3), and flat washer (Figure 4, Item 1) that secure ground strap (Figure 4, Item 4) to AC generator housing (Figure 2, Item 4).
11. Reinstall screw (Figure 4, Item 5), lock washer (Figure 4, Item 2), lock washer (Figure 4, Item 3), and flat washer (Figure 4, Item 1) to their mounting location on AC generator housing after ground strap (Figure 4, Item 4) has been removed.

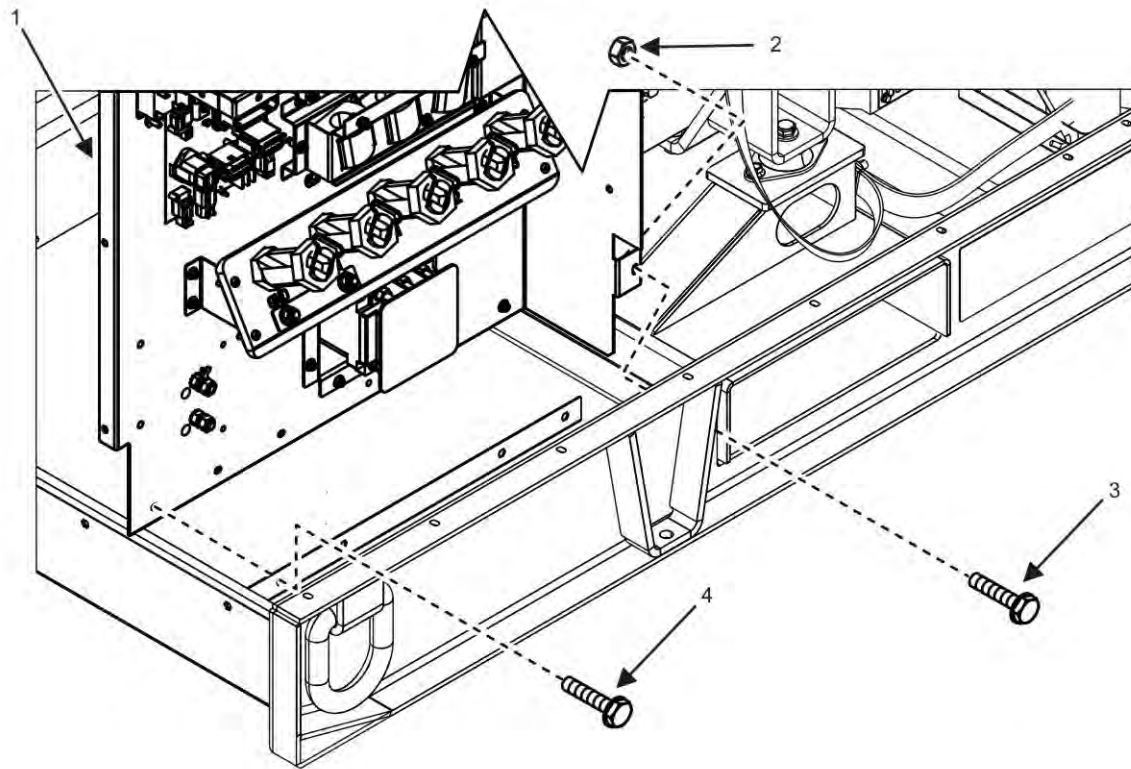


Figure 3. Output Box — Removal.

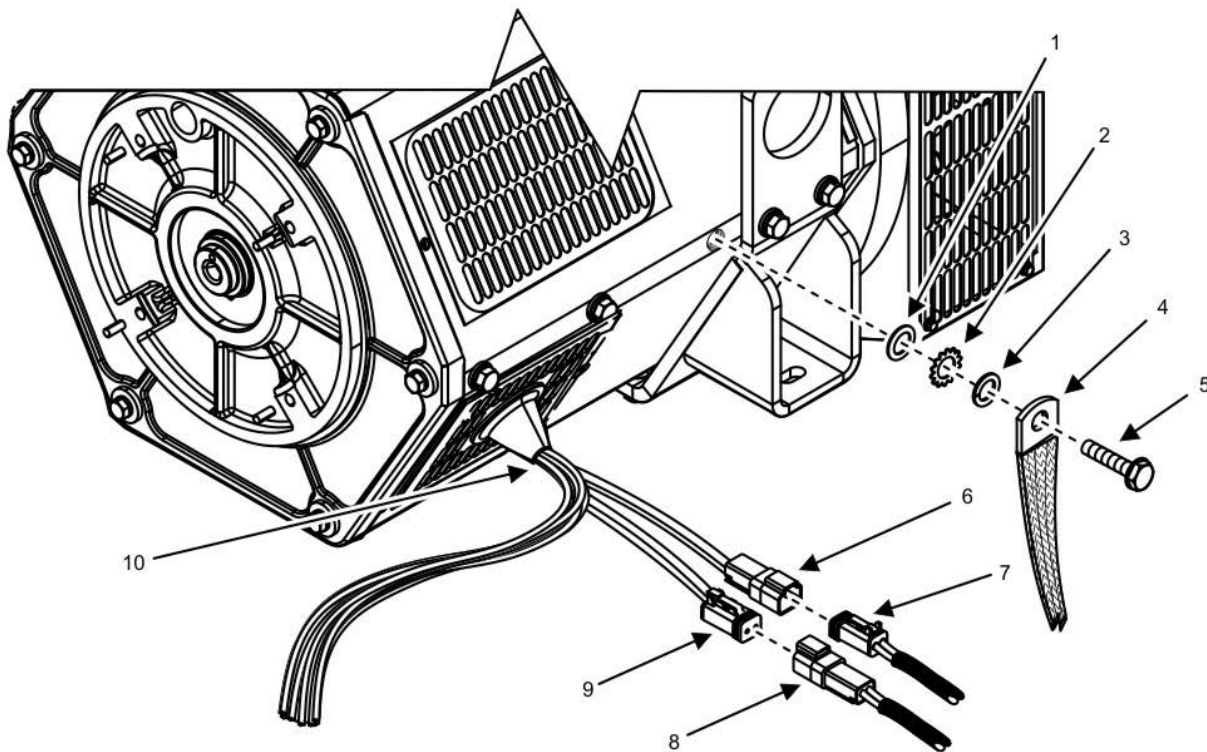
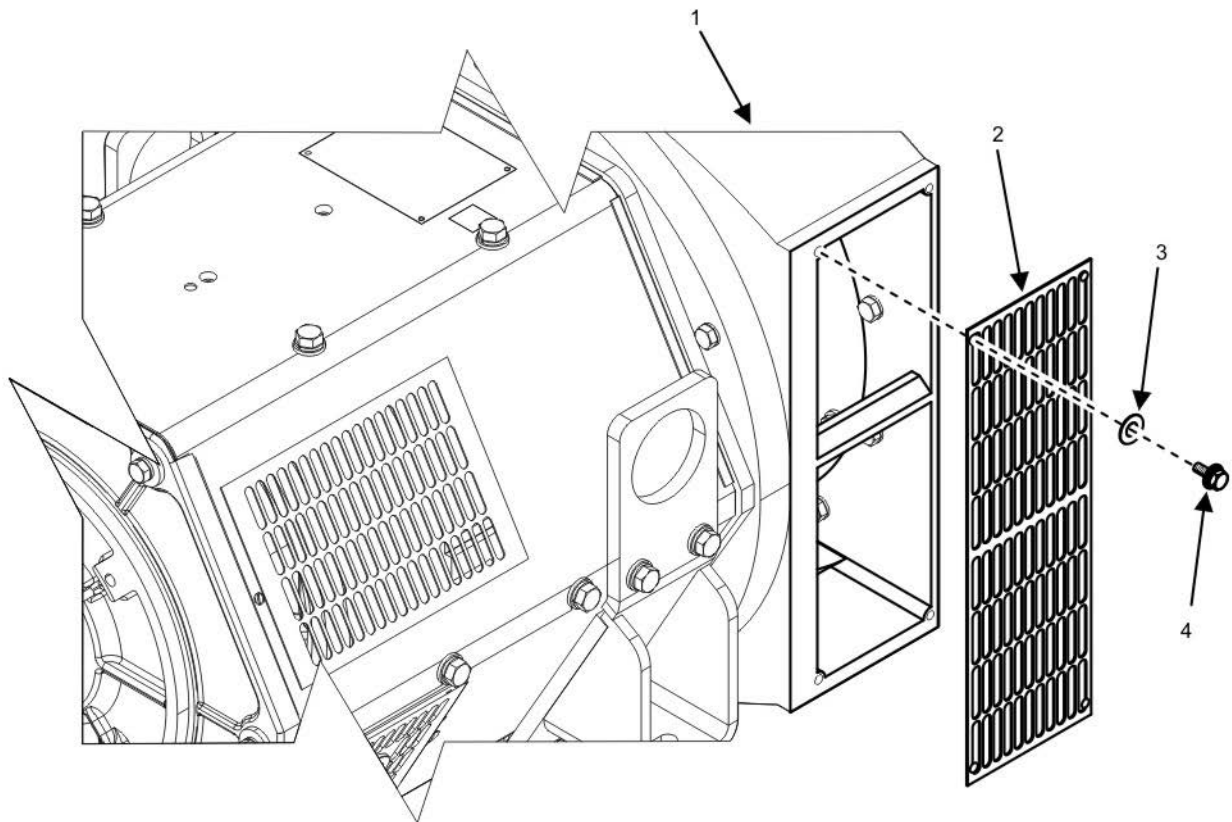


Figure 4. 50/60 Hz AC Generator Assembly Wiring and Ground Strap — Removal.

12. Tag and remove engine wiring harness connector (P90) (Figure 4, Item 7) from generator pigtail connector (Figure 4, Item 6).
13. Tag and remove engine wiring harness connector (P85) (Figure 4, Item 8) from generator pigtail connector (Figure 4, Item 9).



**Figure 5. 50/60 Hz AC Generator Screen — Removal.**

14. Remove four screws with captive washers (Figure 5, Item 3) and screen (Figure 5, Item 2) from right-side of AC generator (Figure 5, Item 1).
15. Repeat step 14 on left-side of AC generator (Figure 5, Item 1).

### **NOTE**

Chains on lifting device should be taut with no slack.

16. Attach suitable lifting device (Figure 6, Item 1) to lift rings (Figure 6, Item 2).
17. Remove screw (Figure 7, Item 1), flat washer (Figure 7, Item 2), snubbing washer (Figure 7, Item 5), and lock nut (Figure 7, Item 4) securing right-side of AC generator to vibration isolator (Figure 7, Item 6). Discard lock nut (Figure 7, Item 4).
18. Repeat step 17 on left side of AC generator.

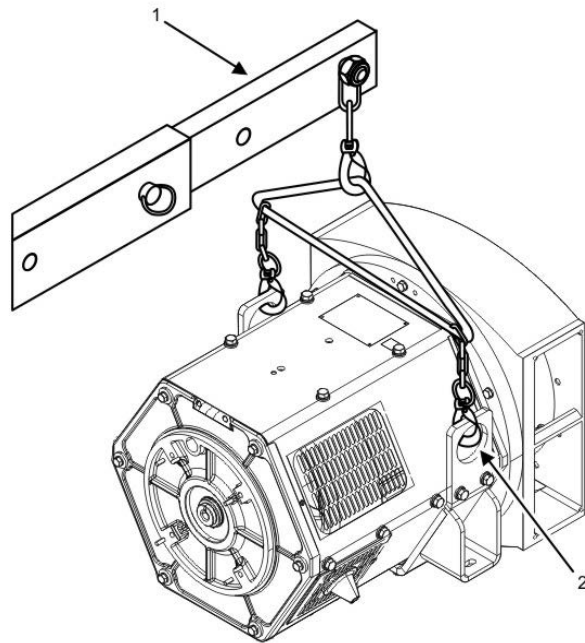


Figure 6. 50/60 Hz AC Generator Lifting Device.

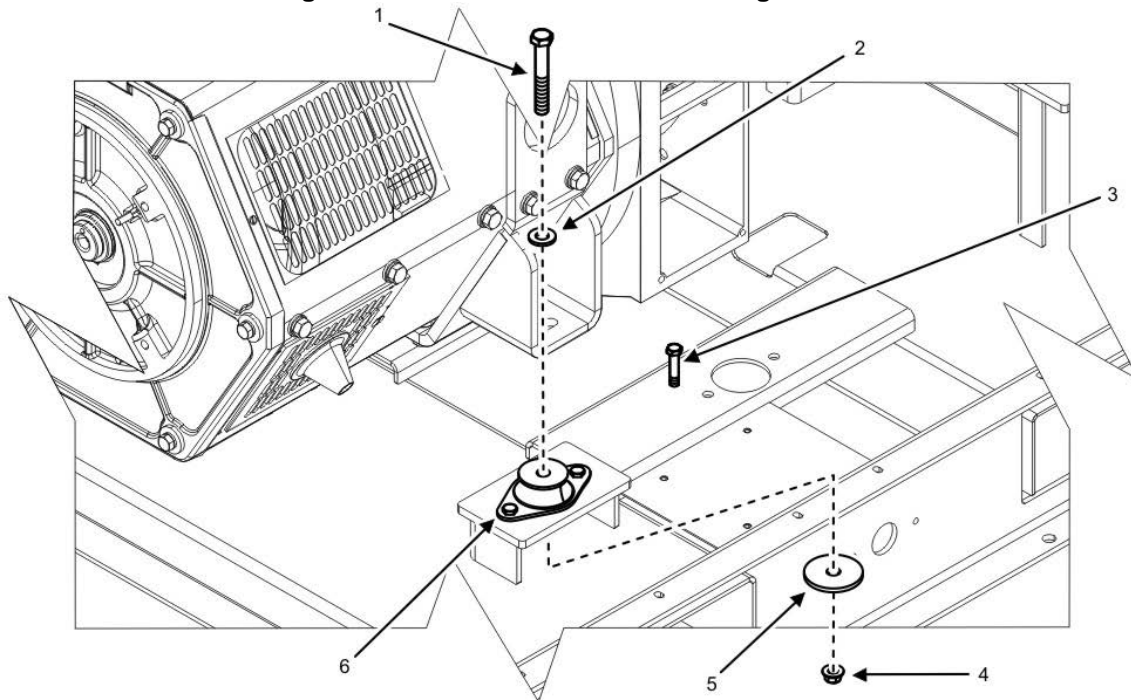
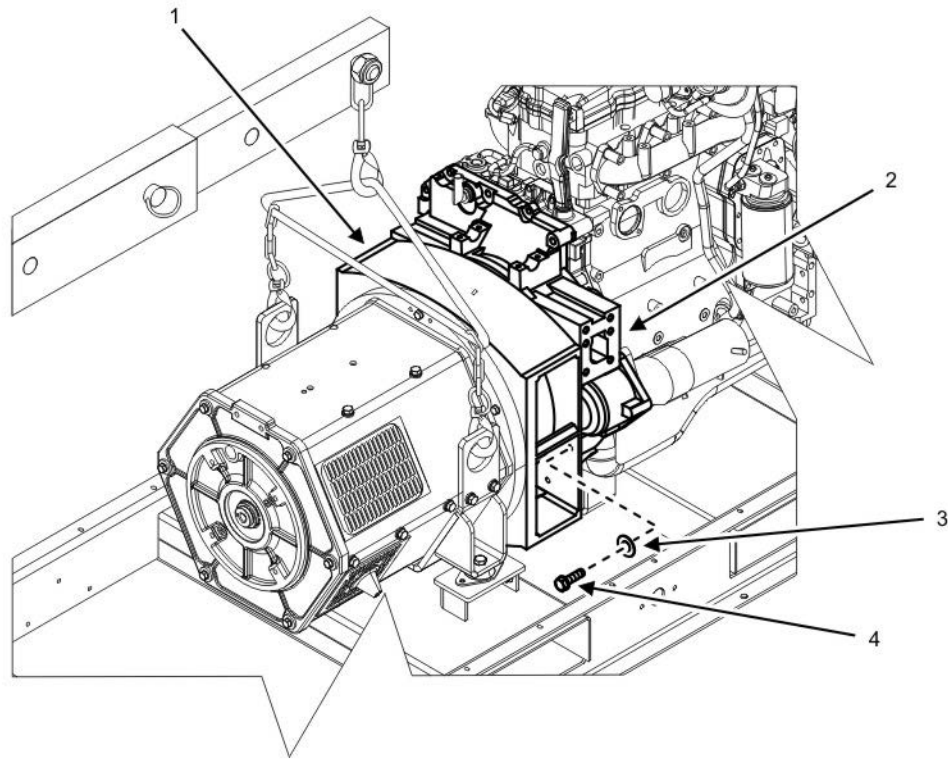


Figure 7. 50/60 Hz AC Generator Mounting — Removal.



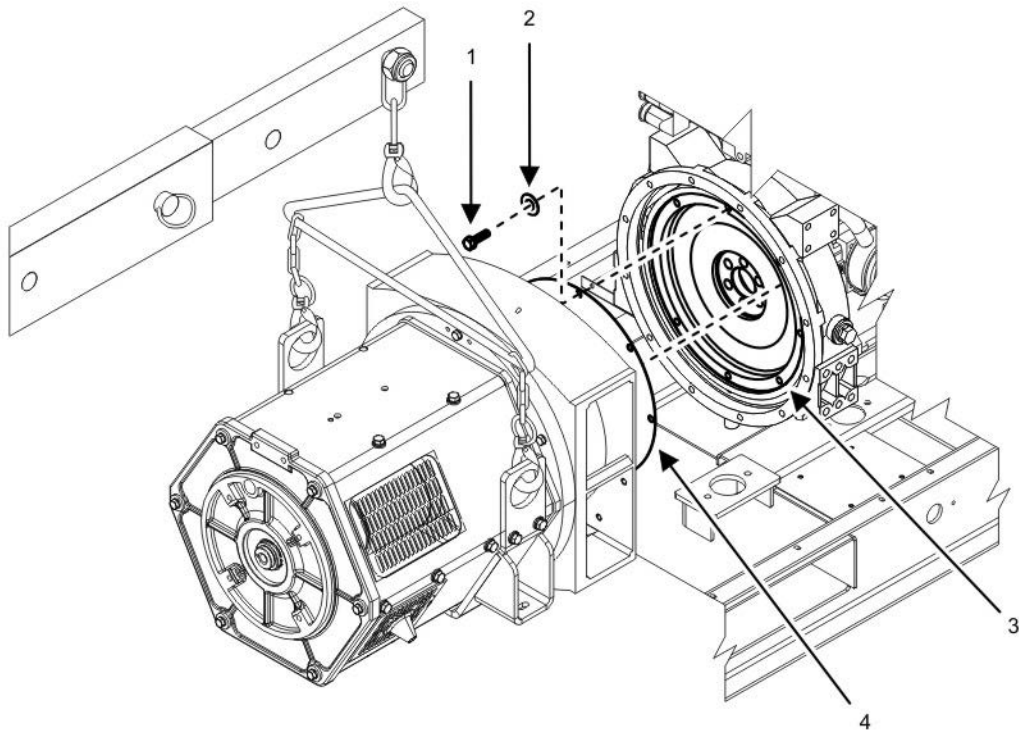
**Figure 8. 50/60 Hz AC Generator/Engine Separation.**

19. Remove 12 screws (Figure 8, Item 4) and 12 flat washers (Figure 8, Item 3) securing AC generator (Figure 8, Item 1) to flywheel housing (Figure 8, Item 2).
20. Remove eight screws (Figure 9, Item 1) and eight flat washers (Figure 9, Item 2) that secure engine flywheel (Figure 9, Item 3) to drive plates (Figure 9, Item 4).

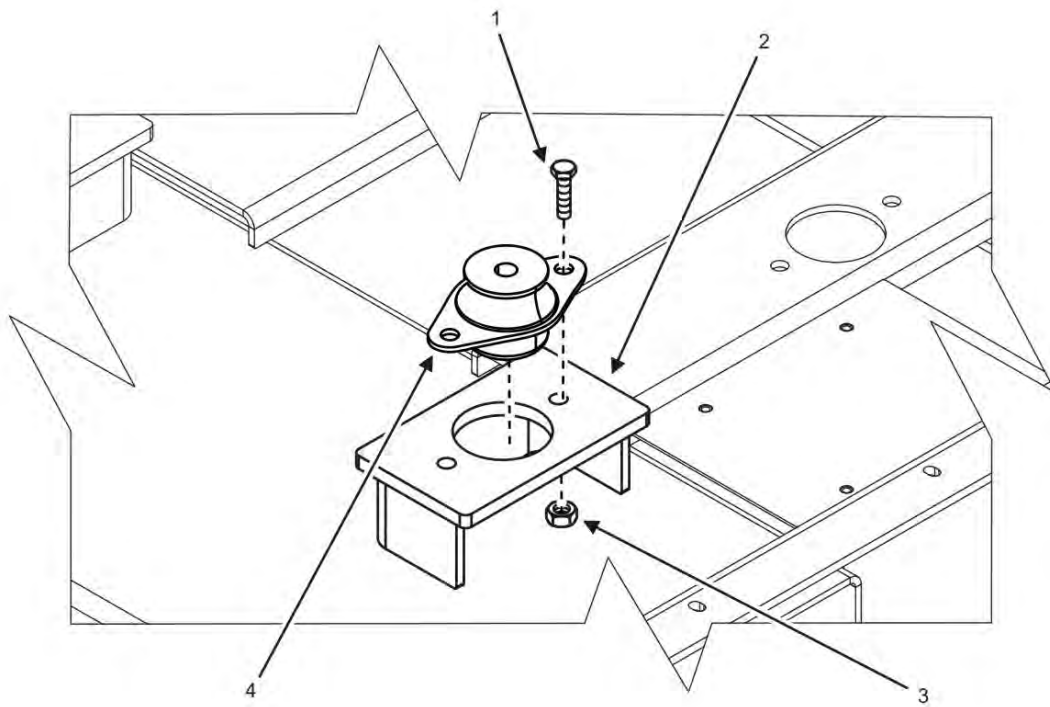
#### **NOTE**

If drive plates (Figure 9, Item 4) remain attached to engine flywheel (Figure 9, Item 3), perform steps 21 through 24 to separate engine flywheel (Figure 9, Item 3) and drive plates (Figure 9, Item 4).

21. Saturate area where engine flywheel (Figure 9, Item 3) and drive plates (Figure 9, Item 4) are connected with penetrating oil.
22. Allow penetrating oil to soak for 1 hr.
23. Raise two jack bolts (Figure 7, Item 3) by turning them counterclockwise to support the AC generator (Figure 5, Item 1).
24. Strike point of contact between engine flywheel (Figure 9, Item 3) and drive plates (Figure 9, Item 4) using a hammer and brass drift around circumference of engine flywheel (Figure 9, Item 3) until two components break free.
25. Remove AC generator (Figure 1) from engine.



**Figure 9. 50/60 Hz AC Generator — Removal.**



**Figure 10. Vibration Isolator — Removal.**



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## CAUTION

Multiple drive plates (Figure 9, Item 4) are installed between AC generator and engine flywheel (Figure 9, Item 3). The number of drive plates (Figure 9, Item 4) installed is critical to the proper alignment of AC generator and engine.

26. Note the number of drive plates (Figure 9, Item 4) installed on AC generator and install cable ties to at least two drive plate mounting holes to preserve drive plate orientation.
27. Place AC generator on a suitable working surface.
28. Lower two jack bolts (Figure 7, Item 3) by turning them clockwise.
29. Remove two screws (Figure 10, Item 1), two nuts (Figure 10, Item 3), and vibration isolator (Figure 10, Item 4) from skid mount (Figure 10, Item 2). Discard vibration isolator (Figure 10, Item 4).
30. Repeat step 29 on opposite side of unit skid.
31. Remove any remaining vibration isolator residue from skid mounts (Figure 10, Item 2) using dry cleaning solvent and wiping rag.

## END OF TASK

### Inspect 50/60 Hz AC Generator Assembly (UOC 98L)

1. Inspect AC generator (Figure 8, Item 1) for damage. Replace AC generator if housing is damaged.
2. Inspect drive plates (Figure 9, Item 4) for damage. Replace AC generator (Figure 8, Item 1) if drive plates (Figure 9, Item 4) are damaged.
3. Inspect left and right mounts on AC generator (Figure 8, Item 1) for indications of structural weakness. Replace AC generator (Figure 8, Item 1) if mounts are damaged.
4. Inspect skid for damage, corrosion, cracks, or other indications of structural weakness or excessive weathering. Replace skid as required.
5. Inspect skid mounts (Figure 10, Item 2) for damage, corrosion, cracks, or other indications of structural weakness or excessive weathering. Replace skid if mounts are damaged.
6. Inspect EMI filter (Figure 2, Item 5) for damage and replace as required.
7. Test rectifier assembly (WP 0057, Test AC Generator).

## END OF TASK

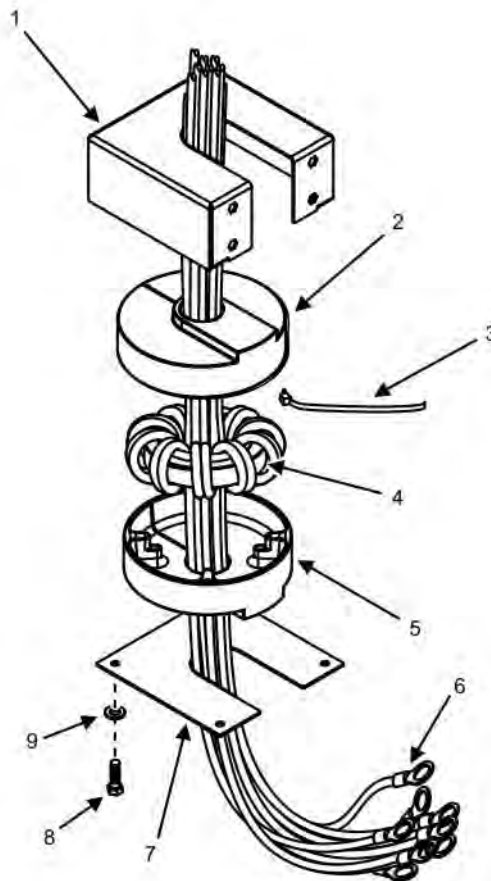
### Replace EMI Filter

1. Remove four screws (Figure 11, Item 8) and four washers (Figure 11, Item 9) securing box cover (Figure 11, Item 7) to potting box (Figure 11, Item 1).
2. Remove lower isolator (Figure 11, Item 5) by sliding it off 10 wire leads (Figure 11, Item 6).
3. Remove two wire ties (Figure 11, Item 3) securing 10 wiring leads (Figure 11, Item 6). Discard wire ties (Figure 11, Item 3).

**CAUTION**

Wire leads (Figure 11, Item 6) are individually wrapped two turns around the ferrite filter (Figure 11, Item 4). Show caution when removing the 10 wire leads (Figure 11, Item 6) from the ferrite filter (Figure 11, Item 4). Failure to comply may cause damage to equipment.

4. Remove 10 wire leads (Figure 11, Item 6) from ferrite filter (Figure 11, Item 4).
5. Remove upper isolator (Figure 11, Item 2) by sliding it off 10 wire leads (Figure 11, Item 6).
6. Inspect upper isolator (Figure 11, Item 2) and lower isolator (Figure 11, Item 5) for damage and replace as required.
7. Inspect ferrite filter (Figure 11, Item 4) for damage and replace as required.
8. Inspect 10 wire leads (Figure 11, Item 6) for damage and replace AC generator stator (Figure 6, Item 1) as required.



**Figure 11. EMI Filter – Replace.**

9. Insert 10 wire leads (Figure 11, Item 6) into upper isolator (Figure 11, Item 2).
10. Insert 10 wire leads (Figure 11, Item 6) individually through the center of the ferrite filter (Figure 11, Item 4) and wrap each wire lead (Figure 11, Item 6) two turns clockwise around the ferrite filter (Figure 11, Item 4).
11. Secure 10 wire leads (Figure 11, Item 6) with two new wire ties (Figure 11, Item 3).

12. Insert 10 wire leads (Figure 11, Item 6) into lower isolator (Figure 11, Item 5).
13. Install potting box (Figure 11, Item 1) and box cover (Figure 11, Item 7) and secure with four screws (Figure 11, Item 8) and four washers (Figure 11, Item 9).

## END OF TASK

### Install 50/60 Hz AC Generator Assembly (UOC 98L)

1. Clean mounting area, hardware, and surrounding skid area of dirt, debris, and grease using wiping rags and dry cleaning solvent.
2. Dispose of wiping rags IAW local SOP.
3. Position new vibration isolators (Figure 10, Item 4) to skid mounts (Figure 10, Item 2) on left- and right-side of skid.
4. Secure each new vibration isolator (Figure 10 Item 4) to skid mount (Figure 10, Item 2) by installing two screws (Figure 10, Item 1) and two nuts (Figure 10, Item 3).
5. Tighten two screws (Figure 10, Item 1) to 35 – 42 ft/lb (48 – 57 Nm).
6. Raise two jack bolts (Figure 7, Item 3) by turning them counterclockwise.
7. Attach lifting device (Figure 6, Item 1) to lift rings (Figure 6, Item 2) of AC generator.

## CAUTION

Multiple drive plates (Figure 9, Item 4) are installed between AC generator and engine flywheel (Figure 9, Item 3). The number of drive plates (Figure 9, Item 4) installed is critical to the proper alignment of AC generator and engine.

8. Apply antiseize compound to the mating surfaces of drive plate (Figure 9, Item 4) and engine flywheel (Figure 9, Item 3).
9. Position AC generator to engine flywheel (Figure 9, Item 3) and align mounting holes of engine flywheel (Figure 9, Item 3) and AC generator drive plates (Figure 9, Item 4).
10. Ensure AC generator assembly is level in lifting device (Figure 6, Item 1).
11. Remove cable ties securing drive plates (Figure 9, Item 4).
12. Secure drive plates (Figure 9, Item 4) to engine flywheel (Figure 9, Item 3) by installing eight screws (Figure 9, Item 1) and flat washers (Figure 9, Item 2) finger-tight.
13. Torque eight screws (Figure 9, Item 1) to 35 – 42 ft/lb (48 – 57 Nm).
14. Re-position AC generator (Figure 8, Item 1) as required to align with flywheel housing (Figure 8, Item 2) mounting holes.
15. Install 12 screws (Figure 8, Item 4) and 12 flat washers (Figure 8, Item 3) to secure AC generator (Figure 8, Item 1) to flywheel housing (Figure 8, Item 2).
16. Tighten 12 screws (Figure 8, Item 4) to 35 – 42 ft/lb (48 – 57 Nm).
17. Align mounting holes in AC generator mounts and vibration isolators (Figure 7, Item 6).
18. Secure AC generator to two vibration isolators (Figure 7, Item 6) by installing two screws (Figure 7, Item 1), two flat washers (Figure 7, Item 2), two snubbing washers (Figure 7, Item 5), and two new lock nuts (Figure 7, Item 4) finger-tight.
19. Lower two jack bolts (Figure 7, Item 3) by turning them clockwise.
20. Tighten two screws (Figure 7, Item 1) to 81 – 98 ft/lb (110 – 134 Nm).
21. Remove lifting device (Figure 6, Item 1) from lift rings (Figure 6, Item 2) of AC generator.

22. Position screen (Figure 5, Item 2) over left-side opening in AC generator (Figure 5, Item 1).
23. Install four screws with captive washers (Figure 5, Item 3) to secure screen (Figure 5, Item 2) to AC generator (Figure 5, Item 1).
24. Repeat step 23 to install right-side screen (Figure 5, Item 2).
25. Remove screw (Figure 4, Item 5), lock washer (Figure 4, Item 3), lock washer (Figure 4, Item 2), and flat washer (Figure 4, Item 1) from AC generator housing. Discard lock washers (Figure 4, Items 2 and 3).
26. Position ground strap (Figure 4, Item 4) to its mounting location on AC generator housing and secure by re-installing screw (Figure 4, Item 5), new lock washer (Figure 4, Item 3), new lock washer (Figure 4, Item 2), and flat washer (Figure 4, Item 1).
27. Tighten screw (Figure 4, Item 5) to 30 – 33 ft/lb (40 – 46 Nm).
28. Apply a thin coat of electrically conductive grease to all electrical connectors.
29. Install connectors (Figure 4, Items 8 and 9) to engine wiring harness connectors (Figure 4, Items 6 and 7) using tags applied during removal as a guide.
30. Position output box (Figure 3, Item 1) to location in skid.
31. Secure output box (Figure 3, Item 1) to skid by installing four screws (Figure 3, Item 4), one screw (Figure 3, Item 3), and one nut (Figure 3, Item 2).

### NOTE

Use tags applied to electrical wires and connectors during removal to aid in installation. Identification tags should remain in place until generator is completely reassembled and has been tested for proper operation.

32. Connect 10 wire leads (Figure 2, Item 6) to AC reconnection board in output box (Figure 2, Item 1) (WP 0060, Remove/Install Voltage Selection Board).
33. Install two finger retainers (Figure 2, Item 2) around six wire leads (Figure 2, Item 5) that exit the lower cutout in the output box (Figure 3, Item 1) and secure by installing two screws (Figure 2, Item 8) and two nuts (Figure 2, Item 7).
34. Install two finger retainers (Figure 2, Item 2) around five wire leads (Figure 2, Item 6) that exit the upper cutout in the output box (Figure 2, Item 1) and secure by installing two screws (Figure 2, Item 10) and two nuts (Figure 2, Item 9).
35. Position finger retainer assembly (Figure 2, Item 3) to its mounting location on output box (Figure 2, Item 1) and secure by installing two screws (Figure 2, Item 8).
36. Repeat step 35 to install the second finger retainer assembly (Figure 2, Item 3).
37. Secure EMI filter (Figure 2, Item 5) to output box (Figure 2, Item 1) by installing four screws (Figure 2, Item 7).
38. Install fuel tank (WP 0052, Remove/Install Fuel Tank).
39. Install starter (WP 0078, Remove/Install Starter).
40. Install all interior body panels (WP 0034, Remove/Install Interior Body Panels).
41. Install right-side body panel (WP 0033, Remove/Install Right-side Body Panel).
42. Install left-side body panel (WP 0032, Remove/Install Left-side Body Panel).
43. Install rear body panel (WP 0031, Remove/Install Rear Body Panel).
44. Install front body panel (WP 0030, Remove/Install Front Body Panel).
45. Install DCS (WP 0017, Remove/Install DCS).

46. Install top body panel (WP 0029, Remove/Install Top Body Panel).
47. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
48. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
49. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
50. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL 400 HZ AC GENERATOR ASSEMBLY**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 FT-LB (WP 0179, Table 2, Item 38)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0179, Table 2, Item 39)

**Materials/Parts**

Generator assembly, 30 kW, 400 Hz (WP 0132, Repair Parts List, Figure 27, Item 1)

Cable, tie (2) (WP 0132, Figure 27, Item 42)

Isolator, vibration (2) (WP 0128, Repair Parts List, Figure 23, Item 4)

Nut, self-locking, hex head (2) (WP 0128, Figure 23, Item 6)

Washer, lock (2) (WP 0132, Figure 27, Item 3)

Antifreeze, ethylene glycol (WP 0180, Expendable and Durable Items List, Item 2)

Cap set, protective (WP 0180, Item 8)

Cleaning compound, solvent (WP 0180, Item 11)

Compound, antiseize (WP 0180, Item 14)

Distilled water (WP 0180, Item 19)

Grease, electrically conductive (WP 0180, Item 22)

Pan, drain (WP 0180, Item 30)

Penetrating oil (WP 0180, Item 31)

Rag, wiping (WP 0180, Item 33)

Strap, tie-down, (6) (WP 0180, Item 36)

Tag, marker (WP 0180, Item 37)

**Personnel Required**

91D (1)

Assistant (2)

**References**

WP 0060, Remove/Install Voltage Selection Board

WP 0091, Remove/Install Flywheel

**Equipment Conditions**

Engine control switch OFF(TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Top body panel removed (WP 0029, Remove/Install Top Body Panel).

DCS removed (WP 0017, Remove/Install DCS)

Front body panel removed (WP 0030, Remove/Install Front Body Panel)

Rear body panel removed (WP 0031, Remove/Install Rear Body Panel)

Right-side body panel removed (WP 0033, Remove/Install Right-side Body Panel)

Left-side body panel removed (WP 0032, Remove/Install Left-side Body Panel)

Interior bulkhead panel removed (WP 0034, Remove/Install Interior Body Panels)

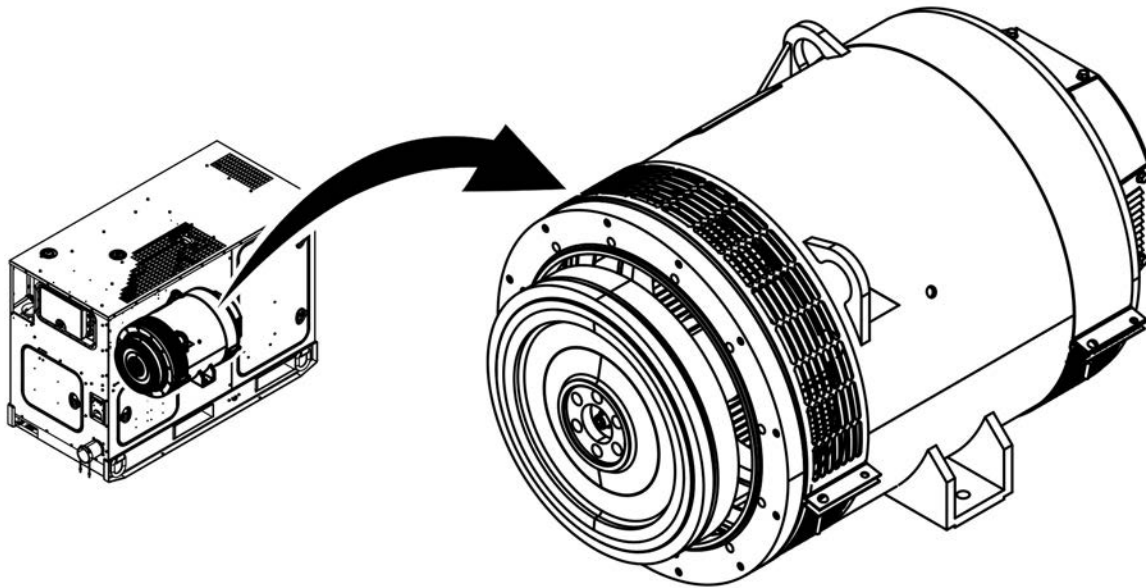
Starter removed (WP 0078, Remove/Install Starter)

Fuel tank removed (WP 0052, Remove/Install Fuel Tank)

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**REMOVE/INSTALL 400 HZ AC GENERATOR ASSEMBLY****WARNING**

- AC generator assembly weighs approximately 800 – 930 lb (362.9 – 421.8 kg). Use suitable lifting device with a capacity of at least 1,500 lb (680.4 kg). Do not stand or put arms, legs, or any body part under hoisted load. Failure to comply may cause injury or death to personnel.
- Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

**Remove 400 Hz AC Generator Assembly (UOC 98M)**

**Figure 1. 400 Hz AC Generator — Location.**

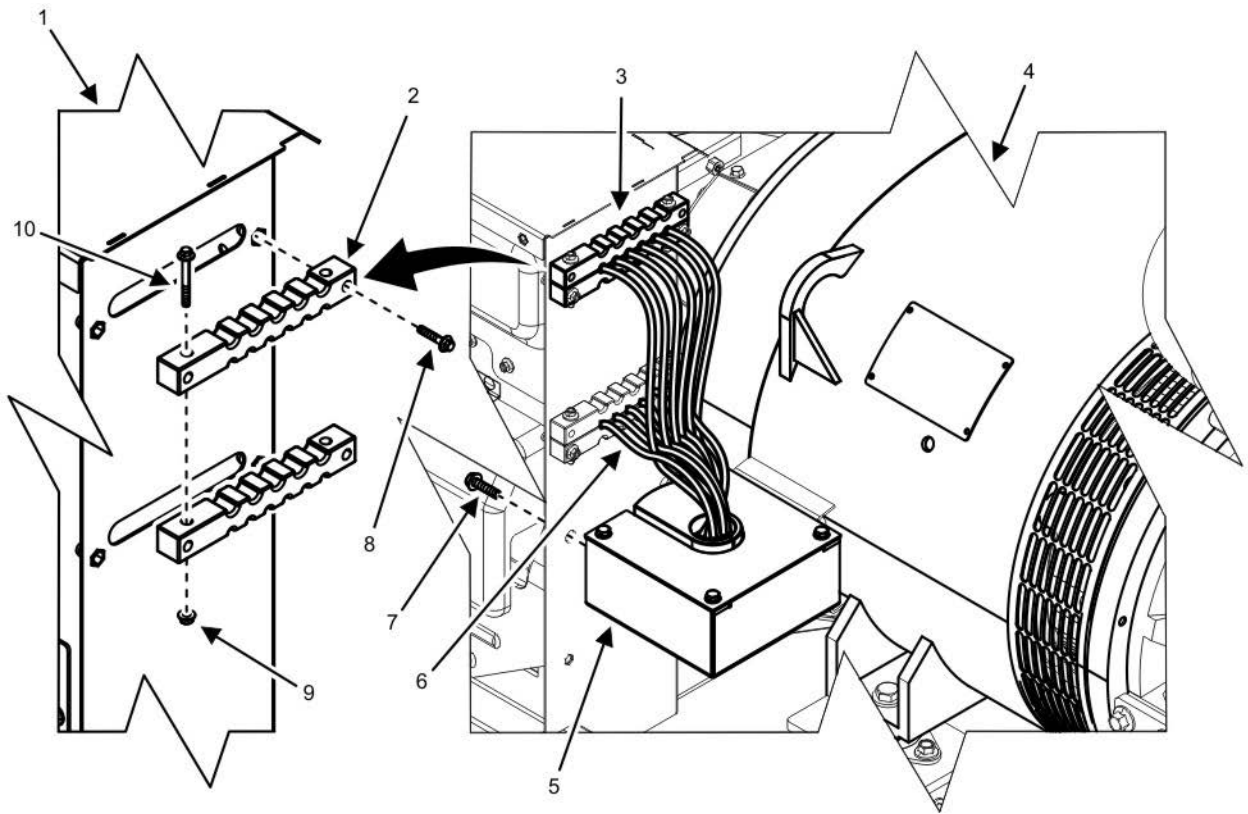
1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate AC generator (Figure 1).

**NOTE**

To assist during installation, tag all electrical wires and connectors prior to removal.

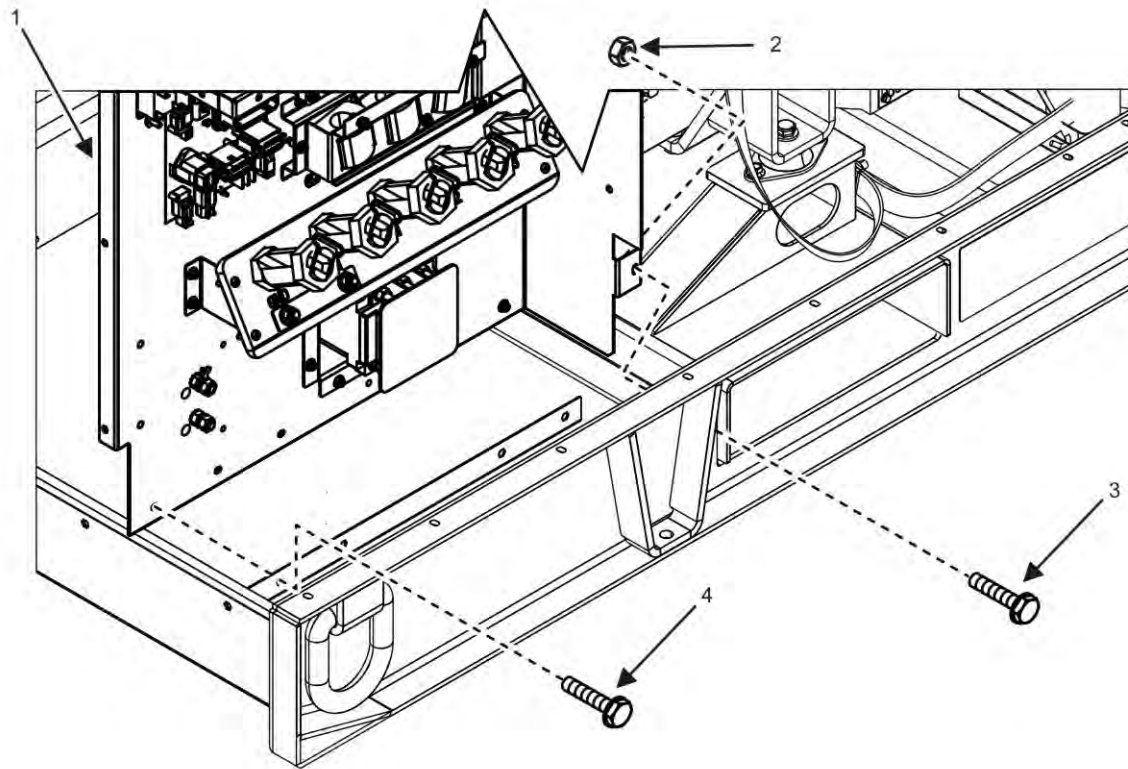
3. Tag and remove AC generator electrical leads from behind voltage selection board (WP 0060, Remove/Install Voltage Selection Board).





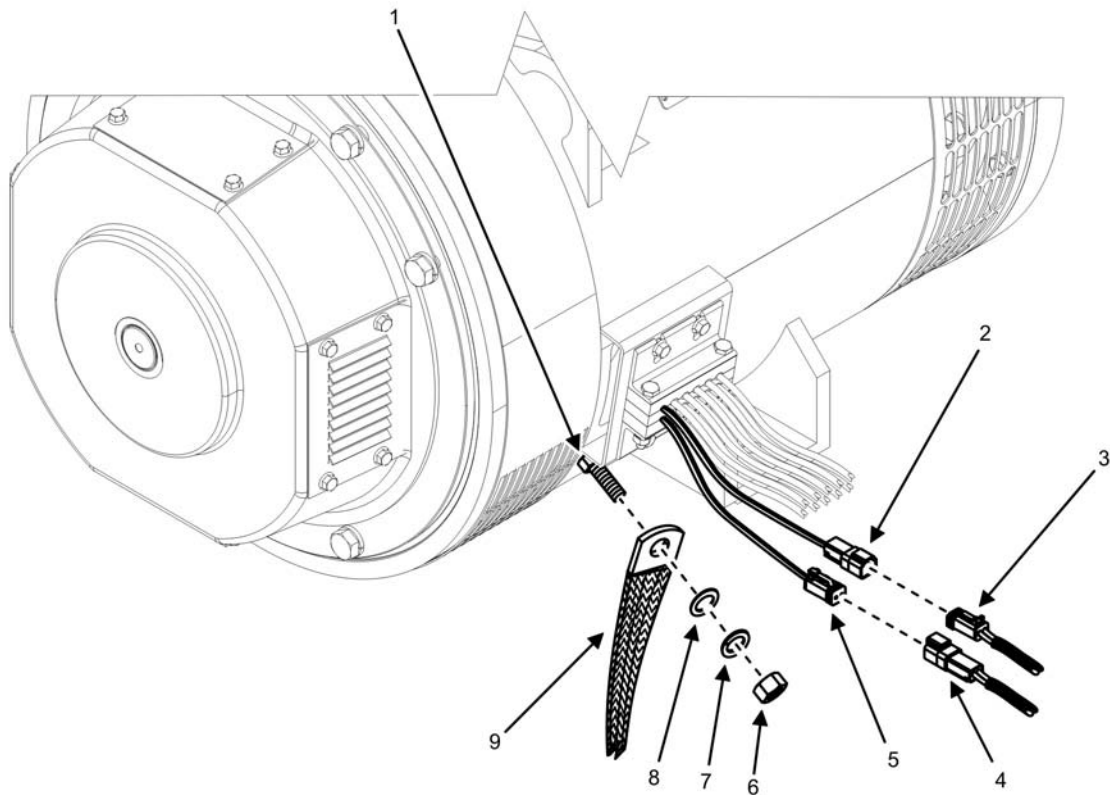
**Figure 2. 400 Hz AC Generator Wiring — Removal.**

4. Remove four screws (Figure 2, Item 7) securing EMI filter (Figure 2, Item 5) to the output box (Figure 2, Item 1).
5. Remove four screws (Figure 2, Item 8) and two finger retainer assemblies (Figure 2, Item 3) from front edge of output box (Figure 2, Item 1).
6. Remove two screws (Figure 2, Item 10), two nuts (Figure 2, Item 9), and two finger retainers (Figure 2, Item 2) from five wire leads (Figure 2, Item 6).
7. Repeat step 5 to remove the second finger retainer assembly (Figure 2, Item 3) from the remaining five wire leads (Figure 2, Item 6).
8. Tag and remove 10 wire leads (Figure 2, Item 6) from AC generator (Figure 2, Item 4) at voltage selection board in output box (Figure 2, Item 1) (WP 0060, Remove/Install Voltage Selection Board).



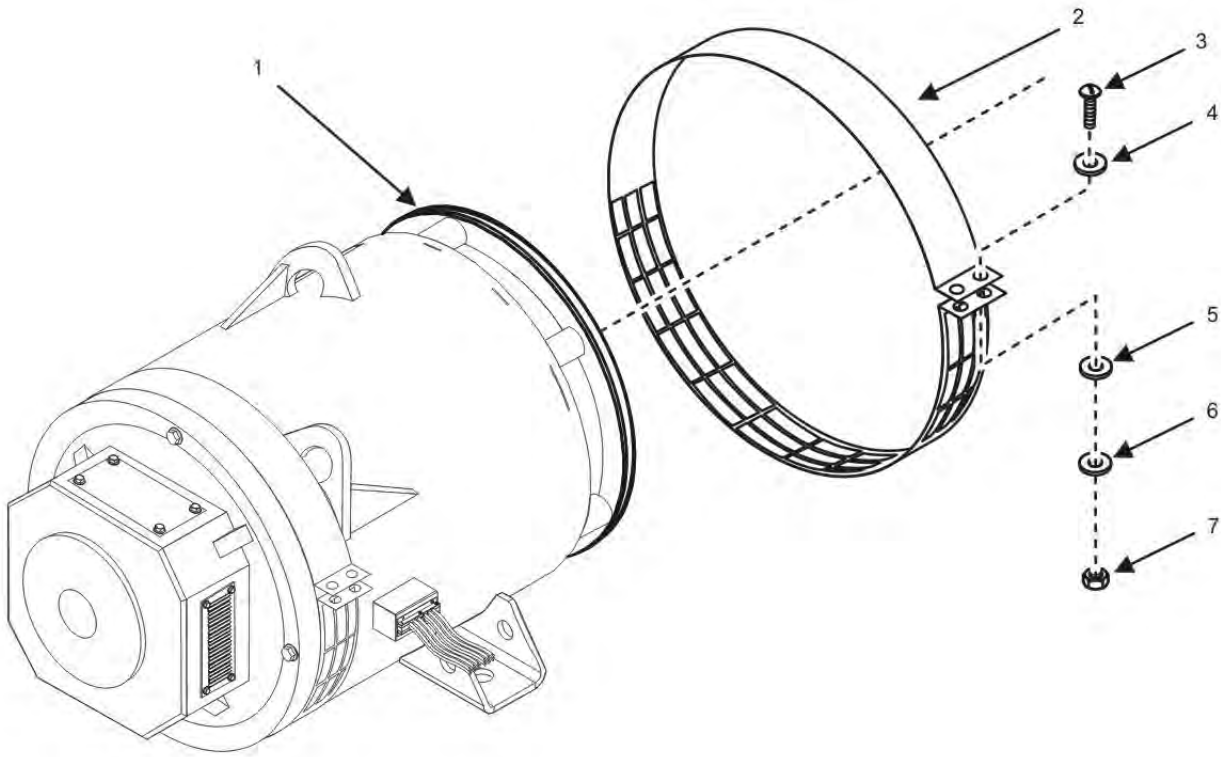
**Figure 3. Output Box — Removal.**

9. Remove screws (Figure 3, Items 3 and 4) and nut (Figure 3, Item 2) that attach output box (Figure 3, Item 1) to skid.
10. Lift output box (Figure 3, Item 1) out of skid and place next to skid.



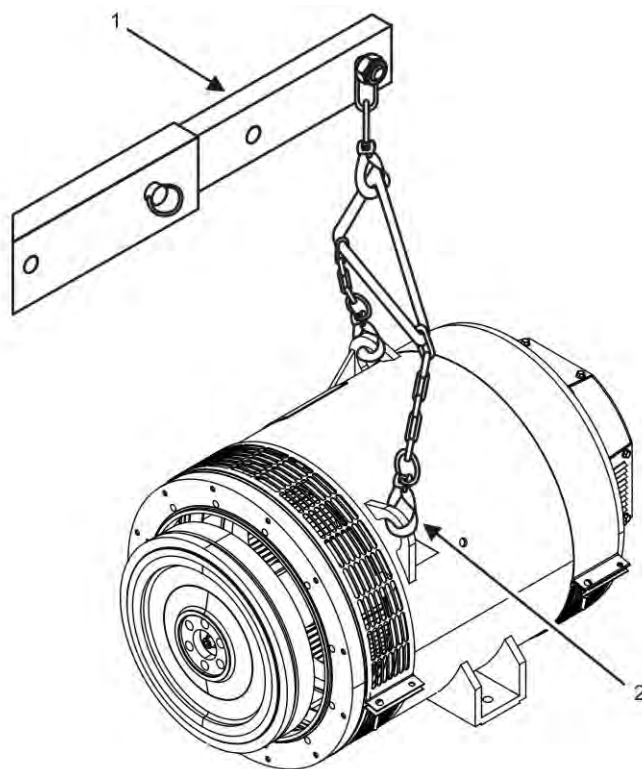
**Figure 4. 400 Hz AC Generator Wiring and Ground Strap — Removal.**

11. Tag and remove connector (P90) (Figure 4, Item 3) from AC generator pigtail connector (Figure 4, Item 2).
12. Remove nut (Figure 4, Item 6), lock washer (Figure 4, Item 7), flat washer (Figure 4, Item 8), and ground strap (Figure 4, Item 9) from stud (Figure 4, Item 1) on AC generator.
13. Discard lock washer (Figure 4, Item 7) and retain nut (Figure 4, Item 6) and flat washer (Figure 4, Item 8) if AC generator is going to be reused.
14. Install nut (Figure 4, Item 6), lock washer (Figure 4, Item 7), and flat washer (Figure 4, Item 8) to stud (Figure 4, Item 1) on AC generator if AC generator is being replaced.



**Figure 5. 400 Hz AC Generator Screen — Removal.**

15. Remove two screws (Figure 5, Item 3), two flat washers (Figure 5, Items 4 and 5), two lock washers (Figure 5, Item 6), and two nuts (Figure 5, Item 7) that secure screen (Figure 5, Item 2) over AC generator (Figure 5, Item 1). Discard lock washers (Figure 5, Item 6).
16. Remove screen (Figure 5, Item 2) from AC generator (Figure 5, Item 1).

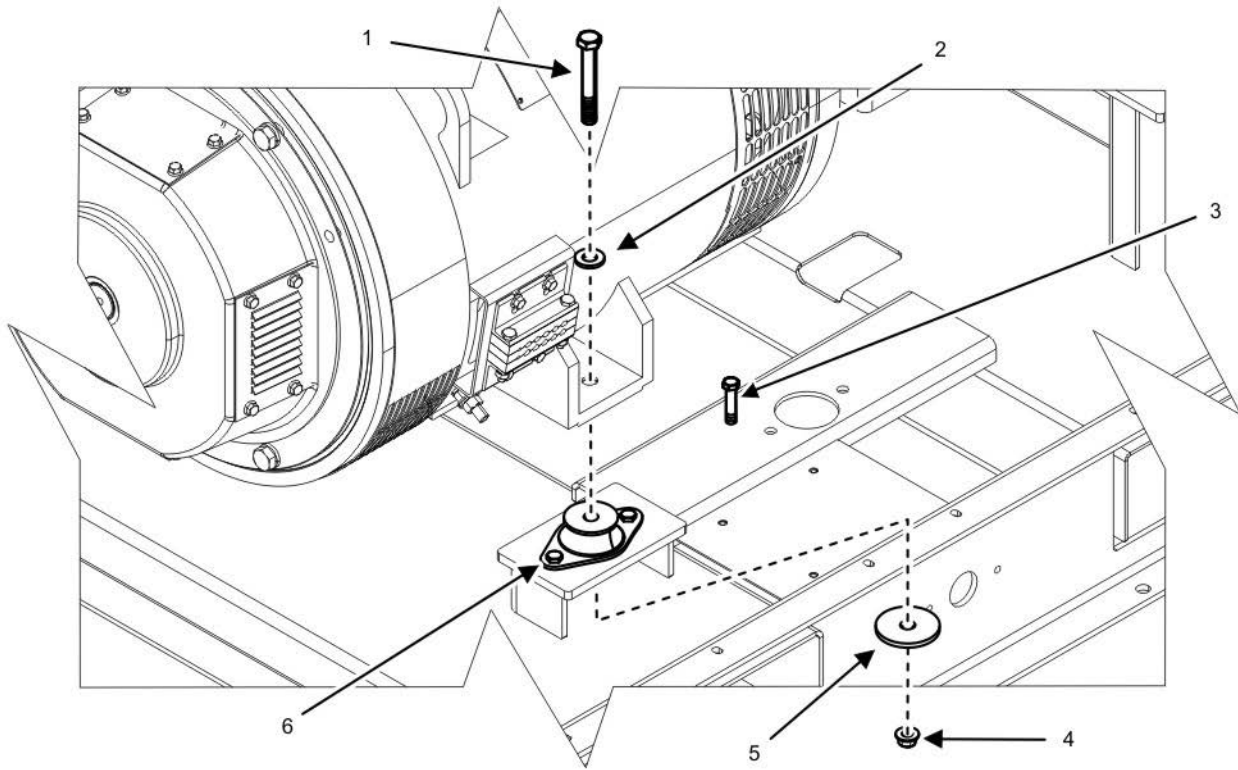


**Figure 6. 400 Hz AC Generator Lifting Device.**

### **CAUTION**

Chains on lifting device should be taut with no slack.

17. Attach suitable lifting device (Figure 6, Item 1) with a capacity of at least a 1,000-lb (454-kg) to lift rings (Figure 6, Item 2) of AC generator.



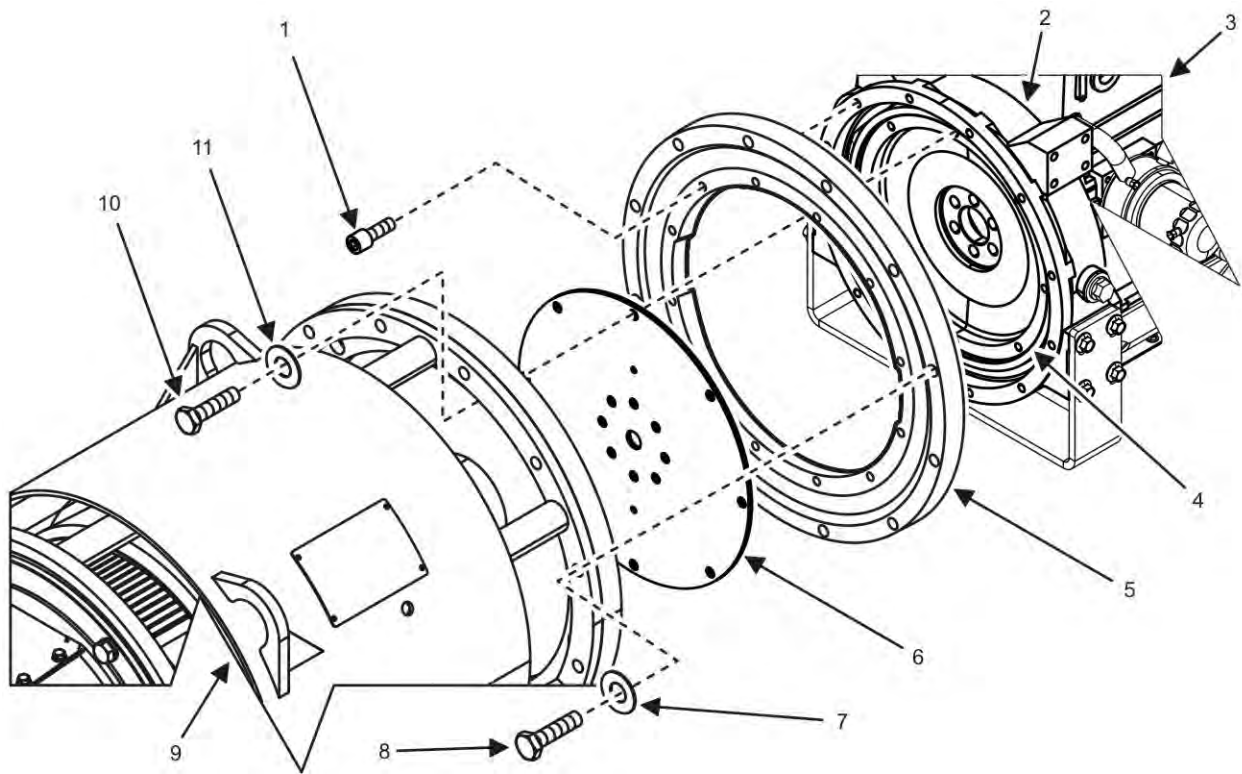
**Figure 7. 400 Hz AC Generator — Removal.**

18. Remove bolt (Figure 7, Item 1), snubbing washer (Figure 7, Item 5), flat washer (Figure 7, Item 2), and lock nut (Figure 7, Item 4) securing right side of AC generator to vibration isolator (Figure 7, Item 6). Discard lock nut (Figure 7, Item 4).
19. Repeat step 18 on left side of AC generator.
20. Remove 12 screws (Figure 8, Item 8) and 12 flat washers (Figure 8, Item 7) securing AC generator (Figure 8, Item 9) to flywheel flange (Figure 8, Item 5).
21. Remove eight screws (Figure 8, Item 10) and eight flat washers (Figure 8, Item 11) that secure drive plates (Figure 8, Item 6) to engine flywheel (Figure 8, Item 4).

### NOTE

If drive plates (Figure 8, Item 6) remain attached to engine flywheel (Figure 8, Item 4) after screws (Figure 8, Item 10) and flat washers (Figure 8, Item 11) have been removed, perform steps 22 through 25 to separate engine flywheel (Figure 8, Item 4) and drive plates (Figure 8, Item 6).

22. Saturate area where engine flywheel (Figure 8, Item 4) and drive plates (Figure 8, Item 6) are connected with penetrating oil.
23. Allow penetrating oil to soak for 1 hr.
24. Raise two jack bolts (Figure 7, Item 3) by turning them counterclockwise to support the AC generator (Figure 5, Item 1).



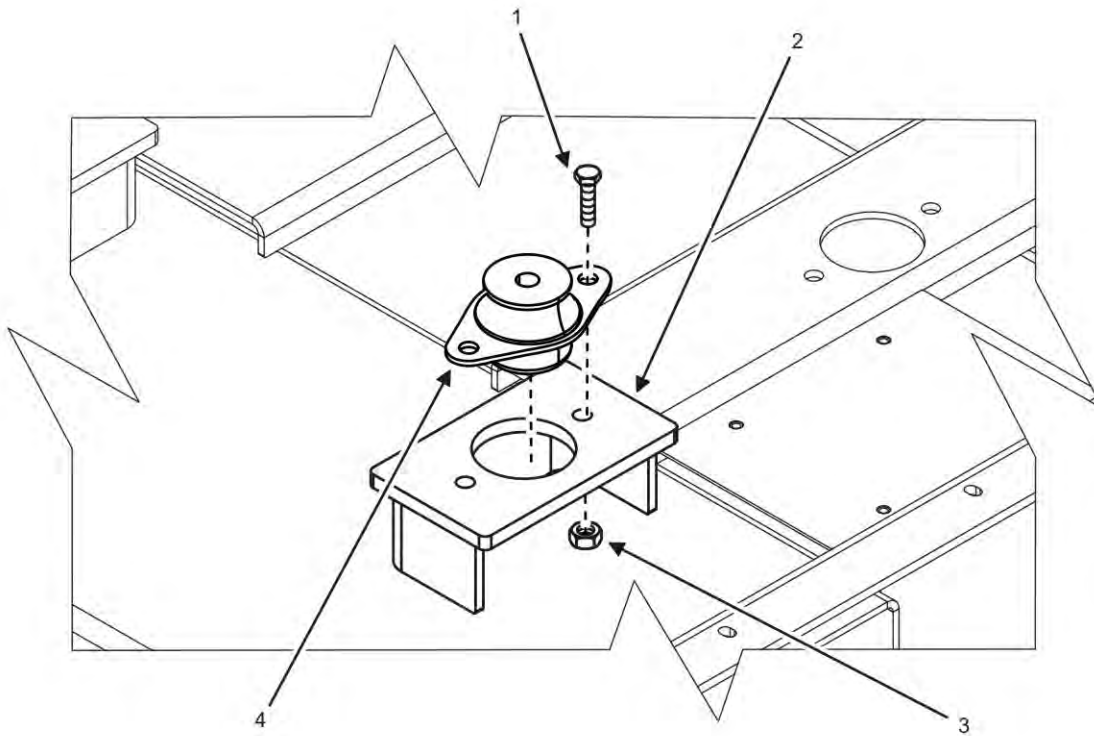
**Figure 8. 400 Hz AC Generator Engine Separation.**

25. Strike point of contact between engine flywheel (Figure 8, Item 4) and drive plates (Figure 8, Item 6) using a hammer and brass drift around circumference of engine flywheel (Figure 8, Item 4) until the two components break free.
26. Remove AC generator (Figure 8, Item 9) from engine.
27. Use cable ties to secure orientation of drive plates (Figure 8, Item 6).
28. Place AC generator (Figure 8, Item 9) on a suitable working surface.
29. Lower two jack bolts (Figure 7, Item 3) by turning them clockwise.

### NOTE

If AC generator (Figure 8, Item 9) is being replaced, flywheel flange (Figure 8, Item 5) must be removed from flywheel housing (Figure 8, Item 2) on engine (Figure 8, Item 3) and shipped with old AC generator (Figure 8, Item 9). Perform steps 30 and 31 only if AC generator is being replaced.

30. Remove 12 screws (Figure 8, Item 1) that secure flywheel flange (Figure 8, Item 5) to flywheel housing (Figure 8, Item 2) if AC generator (Figure 8, Item 9) is being replaced.
31. Package flywheel flange (Figure 8, Item 5) with AC generator (Figure 8, Item 9) for return to overhaul facility.



**Figure 9. Vibration Isolator — Removal.**

32. Remove two screws (Figure 9, Item 1) and two nuts (Figure 9, Item 3) securing vibration isolator (Figure 9, Item 4) to skid mount (Figure 9, Item 2). Discard vibration isolator (Figure 9, Item 4).
33. Remove any remaining vibration isolator residue from mounts with dry cleaning solvent and wiping rag.

**END OF TASK**

**Inspect 400 Hz AC Generator Assembly (UOC 98M)**

1. Inspect AC generator (Figure 8, Item 9) for damage. Replace AC generator (Figure 8, Item 9) if housing is damaged.
2. Inspect drive plates (Figure 8, Item 6) for damage. Replace AC generator (Figure 8, Item 9) if drive plates (Figure 8, Item 6) are damaged.
3. Inspect left and right mounts on AC generator (Figure 8, Item 9) for indications of structural weakness. Replace AC generator (Figure 8, Item 9) if mounts are damaged.
4. Inspect skid for damage, corrosion, cracks, or other indications of structural weakness or excessive weathering. Replace skid as required.
5. Inspect skid mounts (Figure 9, Item 2) for damage, corrosion, cracks, or other indications of structural weakness or excessive weathering. Replace skid if mounts are damaged.
6. Inspect EMI filter (Figure 2, Item 5) for damage and replace as required.
7. Test rectifier assembly (WP 0057, Test AC Generator).

**END OF TASK**



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**Replace EMI Filter**

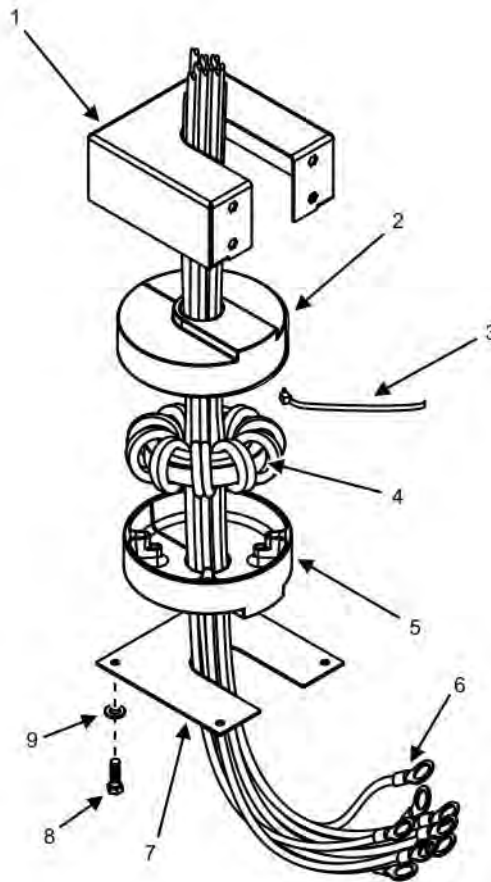
1. Remove four screws (Figure 9, Item 8) and four washers (Figure 9, Item 9) securing box cover (Figure 9, Item 7) to potting box (Figure 9, Item 1).
2. Remove lower isolator (Figure 9, Item 5) by sliding it off 10 wire leads (Figure 9, Item 6).
3. Remove two wire ties (Figure 9, Item 3) securing 10 wiring leads (Figure 9, Item 6). Discard wire ties (Figure 9, Item 3).

**CAUTION**

Wire leads (Figure 9, Item 6) are individually wrapped two turns around the ferrite filter (Figure 9, Item 4). Show caution when removing the 10 wire leads (Figure 9, Item 6) from the ferrite filter (Figure 9, Item 4). Failure to comply may cause damage to equipment.

4. Remove 10 wire leads (Figure 9, Item 6) from ferrite filter (Figure 9, Item 4).
5. Remove upper isolator (Figure 9, Item 2) by sliding it off 10 wire leads (Figure 9, Item 6).
6. Inspect upper isolator (Figure 9, Item 2) and lower isolator (Figure 9, Item 5) for damage and replace as required.
7. Inspect ferrite filter (Figure 9, Item 4) for damage and replace as required.
8. Inspect 10 wire leads (Figure 9, Item 6) for damage and replace AC generator stator (Figure 6, Item 1) as required.
9. Insert 10 wire leads (Figure 9, Item 6) into upper isolator (Figure 9, Item 2).
10. Insert 10 wire leads (Figure 9, Item 6) individually through the center of the ferrite filter (Figure 9, Item 4) and wrap each wire lead (Figure 9, Item 6) two turns clockwise around the ferrite filter (Figure 9, Item 4).
11. Secure 10 wire leads (Figure 9, Item 6) with two new wire ties (Figure 9, Item 3).
12. Insert 10 wire leads (Figure 9, Item 6) into lower isolator (Figure 9, Item 5).
13. Install potting box (Figure 9, Item 1) and box cover (Figure 9, Item 7) and secure with four screws (Figure 9, Item 8) and four washers (Figure 9, Item 9).

**END OF TASK**



**Figure 9. EMI Filter – Replace.**

### **Install 400 Hz AC Generator Assembly (UOC 98M)**

#### **NOTE**

If AC generator (Figure 8, Item 9) is being replaced, new flywheel flange (Figure 8, Item 5) from replacement AC generator (Figure 8, Item 9) must be installed from to flywheel housing (Figure 8, Item 2) on engine (Figure 8, Item 3) prior to installation of new AC generator (Figure 8, Item 9). Perform steps 1 and 3 only if a new AC generator (Figure 8, Item 9) is being installed.

1. Position flywheel flange (Figure 8, Item 5) to generator housing and align the mounting holes.
2. Secure flywheel flange (Figure 8, Item 5) to generator housing by installing 12 screws (Figure 8, Item 8) and 12 flat washers (Figure 8, Item 7) finger-tight.
3. Tighten 12 screws (Figure 8, Item 8) to 35 – 42 ft/lb (48 – 57 Nm) using a crossing pattern.
4. Clean skid mounts (Figure 9, Item 2), hardware, and surrounding skid area of dirt, debris, and grease using wiping rags and dry cleaning solvent.
5. Dispose of wiping rags IAW local SOP.
6. Position new vibration isolators (Figure 9, Item 4) to skid mounts (Figure 9, Item 2) on left- and right-sides of skid.

7. Secure each new vibration isolator (Figure 9, Item 4) to skid mount (Figure 9, Item 2) by installing two screws (Figure 9, Item 1) and two nuts (Figure 9, Item 3).
8. Tighten two screws (Figure 9, Item 1) to 35 – 42 ft/lb (48 – 57 Nm).
9. Raise two jack bolts (Figure 7, Item 3) by turning them counterclockwise.
10. Attach lifting device (Figure 6, Item 1) to lift rings (Figure 6, Item 2) of AC generator.

### CAUTION

Multiple drive plates (Figure 8, Item 6) are installed between AC generator (Figure 8, Item 9) and engine flywheel (Figure 8, Item 4). The number of drive plates (Figure 8, Item 6) installed is critical to the proper alignment of AC generator (Figure 8, Item 9) and engine (Figure 8, Item 3).

11. Apply antiseize compound to the mating surfaces of drive plate (Figure 8, Item 6) and engine flywheel (Figure 8, Item 4).
12. Position drive plates (Figure 8, Item 6) to engine flywheel (Figure 8, Item 4) and align mounting holes.
13. Install eight screws (Figure 8, Item 10) and eight flat washers (Figure 8, Item 11) finger-tight to secure drive plates (Figure 8, Item 6) to engine flywheel (Figure 8, Item 4).
14. Tighten eight screws (Figure 8, Item 10) to 35 – 42 ft/lb (48 – 57 Nm) using a crossing pattern.
15. Lower AC generator (Figure 8, Item 9) as required to align generator housing and flywheel flange (Figure 8, Item 5) mounting holes.
16. Align mounting holes in AC generator mounts and vibration isolators (Figure 7, Item 5).
17. Secure AC generator to two vibration isolators (Figure 7, Item 6) by installing two screws (Figure 7, Item 1), two flat washers (Figure 7, Item 2), two snubbing washers (Figure 7, Item 5), and two new lock nuts (Figure 7, Item 4) finger-tight.
18. Lower two jack bolts (Figure 7, Item 3) by turning them clockwise.
19. Tighten two bolts (Figure 7, Item 1) to 81 – 98 ft/lb (110 – 134 Nm).
20. Remove lifting device (Figure 6, Item 1) from lift rings (Figure 6, Item 2) of AC generator.
21. Position screen (Figure 5, Item 2) to its mounting location on AC generator (Figure 5, Item 1).
22. Install two each screws (Figure 5, Item 3), flat washers (Figure 5, Items 4, and 5), new lock washers (Figure 5, Item 6), and nuts (Figure 5, Item 7) to secure screen (Figure 5, Item 2) over AC generator (Figure 5, Item 1).
23. Apply a thin coat of electrically conductive grease to electrical connectors (Figure 4, Items 2, 3, 4, and 5).
24. Install connector (P85) (Figure 4, Item 4) to AC generator pigtail connector (Figure 4, Item 5) using tags applied during removal as a guide.
25. Install connector (P90) (Figure 4, Item 3) to AC generator pigtail connector (Figure 4, Item 2) using tags applied during removal as a guide.
26. Position ground strap (Figure 4, Item 9) to its mounting location on stud (Figure 4, Item 1) and secure by re-installing flat washer (Figure 4, Item 8), new lock washer (Figure 4, Item 7), and nut (Figure 4, Item 6).
27. Tighten nut (Figure 4, Item 6) to 30 – 33 ft/lb (40 – 46 Nm).
28. Position output box (Figure 3, Item 1) to location in skid.
29. Secure output box (Figure 3, Item 1) to skid by installing four screws (Figure 3, Item 4), screw (Figure 3, Item 3), and nut (Figure 3, Item 2).

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**NOTE**

Use tags applied to electrical wires and connectors during removal to aid in installation. Identification tags should remain in place until generator is completely reassembled and has been tested for proper operation.

30. Connect 10 wire leads (Figure 2, Item 6) to AC reconnection board in output box (Figure 2, Item 1) (WP 0060, Remove/Install Voltage Selection Board).
31. Install two finger retainers (Figure 2, Item 2) around six wire leads (Figure 2, Item 5) that exit the lower cutout in the output box (Figure 3, Item 1) and secure by installing two screws (Figure 2, Item 8) and two nuts (Figure 2, Item 7).
32. Install two finger retainers (Figure 2, Item 2) around five wire leads (Figure 2, Item 6) that exit the upper cutout in the output box (Figure 2, Item 1) and secure by installing two screws (Figure 2, Item 10) and two nuts (Figure 2, Item 9).
33. Position finger retainer assembly (Figure 2, Item 3) to its mounting location on output box (Figure 2, Item 1) and secure by installing two screws (Figure 2, Item 8).
34. Repeat step 33 to install the second finger retainer assembly (Figure 2, Item 3).
35. Secure EMI filter (Figure 2, Item 5) to output box (Figure 2, Item 1) by installing four screws (Figure 2, Item 7).
36. Install fuel tank (WP 0052, Remove/Install Fuel Tank).
37. Install starter (WP 0078, Remove/Install Starter).
38. Install all interior body panels (WP 0034, Remove/Install Interior Body Panels).
39. Install right-side body panel (WP 0033, Remove/Install Right-side Body Panel).
40. Install left-side body panel (WP 0032, Remove/Install Left-side Body Panel).
41. Install rear body panel (WP 0031, Remove/Install Rear Body Panel).
42. Install front body panel (WP 0030, Remove/Install Front Body Panel).
43. Install DCS (WP 0017, Remove/Install DCS).
44. Install top body panel (WP 0029, Remove/Install Top Body Panel).
45. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
46. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
47. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
48. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**TEST AC GENERATOR**

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**INITIAL SETUP:****Test Equipment**

Load Bank (WP 0179, Table 2, Item 2)  
**Tools and Special Tools**

Hammer, Hand, Soft Face, Dead Blow (WP 0179, Table 2, Item 12)

Puller Set, Mechanical (WP 0179, Table 2, Item 20)

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 FT-LB (WP 0179, Table 2, Item 38)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Bearing, ball (WP 0130, Repair Parts List, Figure 25, Item 14)

Bearing, ball, annular (WP 0132, Repair Parts List, Figure 27, Item 14)

Exciter, armature (WP 0133, Repair Parts List, Figure 28, Item 13)

Nut, lock (4) (WP 0131, Repair Parts List, Figure 26, Item 6)

Nut, self-locking (13) (WP 0123, Repair Parts List, Figure 18, Item 12)

O-ring (WP 0132, Figure 27, Item 13)

Rectifier assembly (WP 0133, Figure 28, Item 10)

Rectifier assembly, forward (WP 0131, Figure 26, Item 1)

Rectifier assembly, reverse (WP 0131, Figure 26, Item 4)

Ring (WP 0130, Figure 25, Item 13)

Ring, retaining (WP 0133, Figure 28, Item 8)

Rotor assembly, wound, exciter (WP 0130, Figure 25, Item 2)

Semiconductor device (3) (WP 0134, Repair Parts List, Figure 29, Item 13)

**Materials/Parts**

Semiconductor device (3) (WP 0134, Figure 29, Item 15)

Stator, exciter (WP 0129, Repair Parts List, Figure 24, Item 44)

Stator, generator (WP 0132, Figure 27, Item 15)

Varistor assembly (WP 0130, Figure 25, Item 3)

Washer, lock (24) (WP 0129, Repair Parts List, Figure 24, Item 8)

Washer, lock (4) (WP 0129, Figure 24, Item 47)

Washer, lock (2) (WP 0130, Figure 25, Item 6)

Washer, lock (24) (WP 0132, Figure 27, Item 3)

Washer, lock (4) (WP 0133, Figure 28, Item 4)

Washer, lock (4) (WP 0133, Figure 28, Item 12)

Washer, lock (WP 0134, Figure 29, Item 4)

Washer, lock (21) (WP 0134, Figure 29, Item 7)

Grease, electrically conductive (WP 0180, Expendable and Durable Items List, Item 22)

Pan, drain (WP 0180, Item 30)

Tag, marker (WP 0180, Item 37)

**Personnel Required**

91D (1)

Assistant (1)

**References**

WP 0033, Remove/Install Right-Side Body Panels

WP 0034, Remove/Install Interior Body Panels

WP 0052, Remove/Install Fuel Tank

WP 0070, Remove/Install Coalescer

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

**INITIAL SETUP — CONTINUED:****Equipment Conditions**

Battery ground cable removed (WP 0037,  
Remove/Install Batteries)

Fuel filler neck removed (WP 0054, Remove/Install  
Fuel Tank Filler Neck)

**TEST AC GENERATOR****WARNING**

Retaining rings and springs are under tension and can act as projectiles when being removed or installed. Use eye protection when removing retaining rings or springs. Failure to comply may cause injury or death to personnel.

**NOTE**

This WP is for testing 50/60 and 400 Hz AC generators. The first part of the procedure is for 50/60 Hz AC generators (UOC 98L) and the second part is for 400 Hz AC generators (UOC 98M).

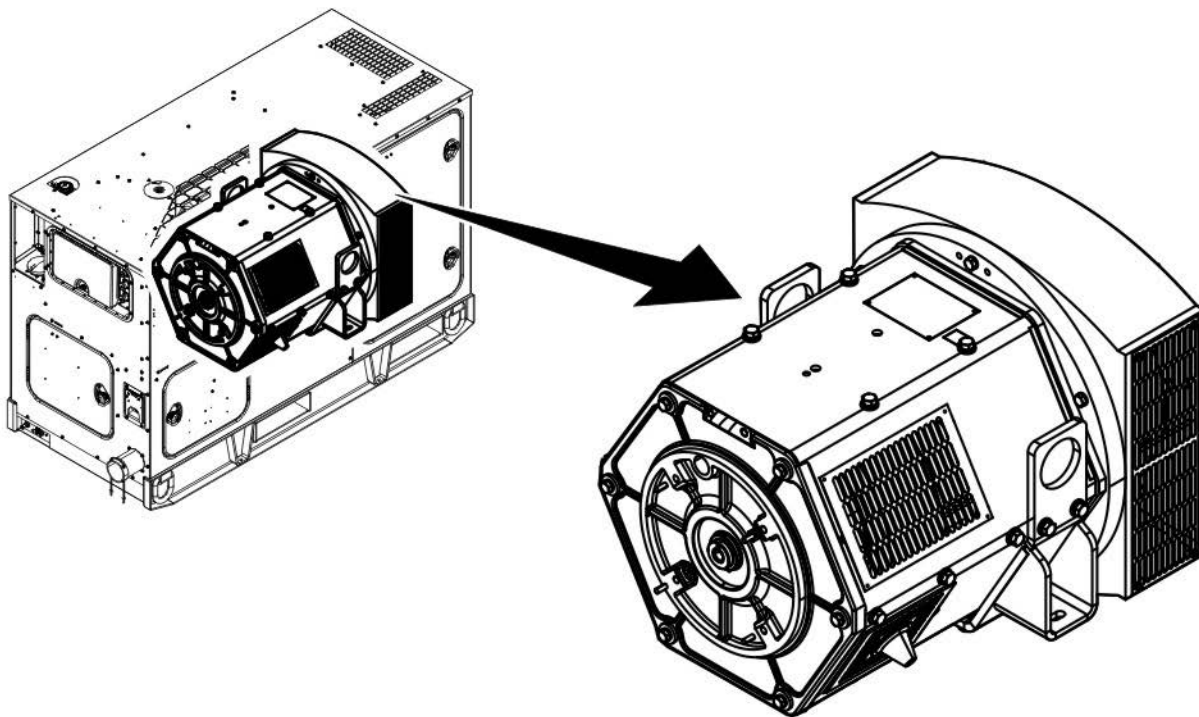
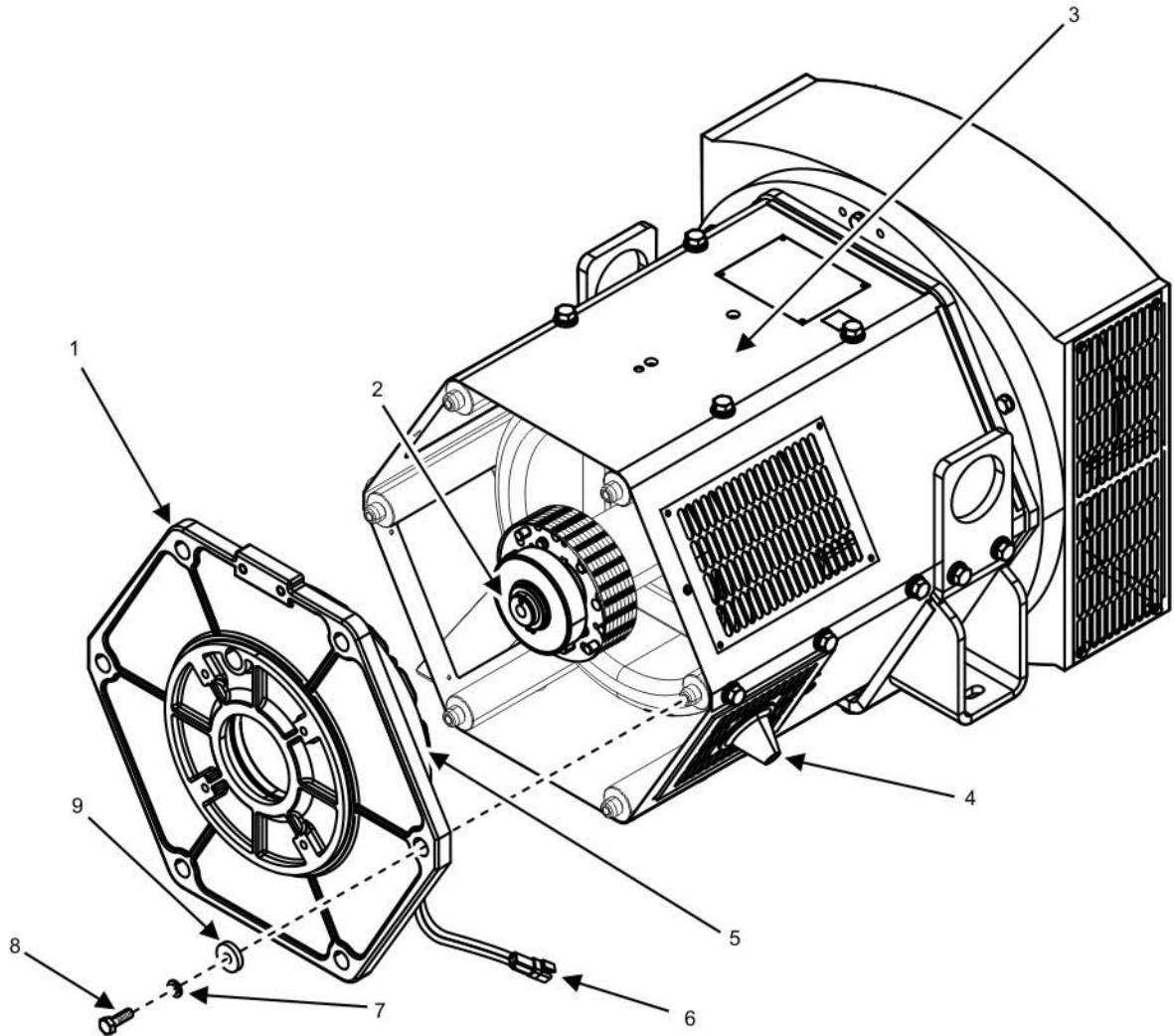
**TEST 50/60 HZ AC GENERATOR (UOC 98L)****Remove End Bell**

Figure 1. 50/60 Hz AC Generator — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate AC generator on set skid (Figure 1).



**Figure 2. 50/60 Hz Generator End Bell — Removal.**

3. Remove coalescer cover (WP 0070, Remove/Install Coalescer).
4. Disconnect coalescer supply hose at coalescer (WP 0070, Remove/Install Coalescer).
5. Disconnect coalescer return hose from top side of radiator support panel (WP 0034, Remove/Install Interior Body Panels).
6. Remove right-side body panel (WP 0033, Remove/Install Right-Side Body Panels).
7. Disconnect coalescer return hose from underside of radiator support panel (WP 0034, Remove/Install Interior Body Panels).
8. Remove interior panels (WP 0034, Remove/Install Interior Body Panels).
9. Remove fuel tank with fuel manifold attached (WP 0052, Remove/Install Fuel Tank).

10. Place tag or mark on end bell (Figure 2, Item 1) and generator stator (Figure 2, Item 3) to note relative position of end bell (Figure 2, Item 1) to generator stator (Figure 2, Item 3).
11. Remove six bolts (Figure 2, Item 8), six lock washers (Figure 2, Item 7), and six flat washers (Figure 2, Item 9) that attach end bell (Figure 2, Item 1) to generator stator (Figure 2, Item 3).
12. Discard six lock washers (Figure 2, Item 7).

### CAUTION

End bell (Figure 2, Item 1) can be removed safely with a pry bar by applying force evenly and alternately to opposite sides. Failure to comply may cause damage to equipment.

Use extreme caution when removing end bell (Figure 2, Item 1) from generator bearing (Figure 2, Item 2). End bell (Figure 2, Item 1) is heavy and must be removed without any exciter stator (Figure 2, Item 5) contact with generator bearing (Figure 2, Item 2). Failure to comply will cause damage to equipment.

16. Disconnect P90 wiring plug (Figure 2, Item 6) from connector (not shown).
17. Place tag or mark on P90 wiring plug (Figure 2, Item 6) wires to indicate length wires extend from generator stator (Figure 2, Item 3).
18. Disengage end bell (Figure 2, Item 1) from generator stator (Figure 2, Item 3) using pry bar(s).
19. Withdraw P90 wiring plug (Figure 2, Item 6) connected to exciter stator (Figure 2, Item 9) through grommet (Figure 2, Item 4) of generator stator (Figure 2, Item 3).

### WARNING

Component being lifted weighs 46 lb (21 kg). Two personnel or suitable lifting device is necessary to lift component. Failure to comply may cause injury or death to personnel.

### NOTE

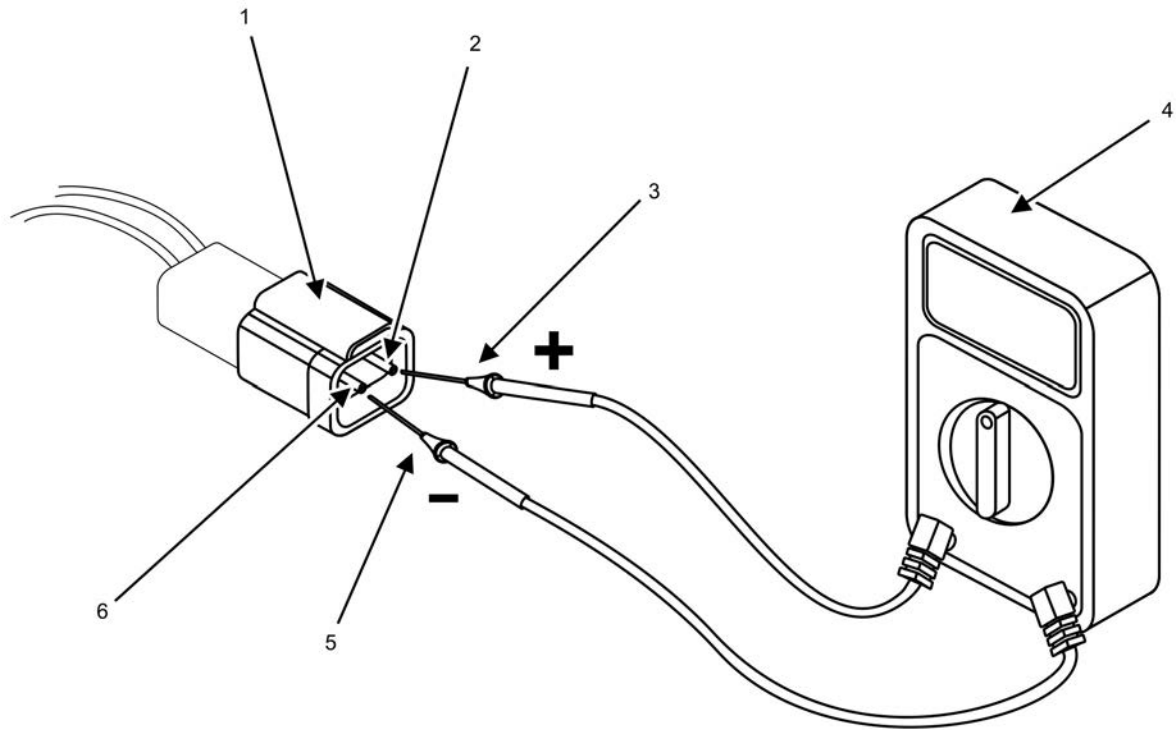
Assistance is required to perform step 20.

20. Remove end bell (Figure 2, Item 1) and exciter stator (Figure 2, Item 5) and place on suitable work surface.
21. Inspect end bell (Figure 2, Item 1), bolts (Figure 2, Item and 8), and exciter stator (Figure 2, Item 5) for signs of metal fractures or fatigue, damaged threads, loose or broken wires, damaged insulation, excessive heat, and/or odor of burned insulation. Replace as required.

### END OF TASK



### Test Exciter Stator Winding



**Figure 3. Test 50/60 Hz Exciter Stator Winding — Detail.**

1. Select Ohms resistance function on multimeter (Figure 3, Item 4).
2. Touch either meter probe (Figure 3, Item 3 or 5) to either pin (Figure 3, Item 2 or 6) of P90 wiring plug (Figure 3, Item 1).
3. Touch second meter probe (Figure 3, Items 3 or 5) to second pin (Figure 3, Item 2 or 6) of P90 wiring plug (Figure 3, Item 1).

#### NOTE

Resistance value of exciter stator (Figure 2, Item 9) obtained in step 4 should be  $21.58 \Omega \pm 10\%$ . Resistance value of zero indicates a shorted exciter stator winding (Figure 2, Item 5), and a resistance value of infinity indicates an open exciter stator winding (Figure 2, Item 5).

4. Observe and record value of resistance.
5. Touch either meter probe (Figure 3, Items 3 or 5) to either pin (Figure 3, Items 2 or 6) of P90 wiring plug (Figure 3, Item 1).
6. Attach second meter probe (Figure 3, Items 3 or 5) to a bare metal area (ground) of exciter stator (Figure 2, Item 5) frame.

#### NOTE

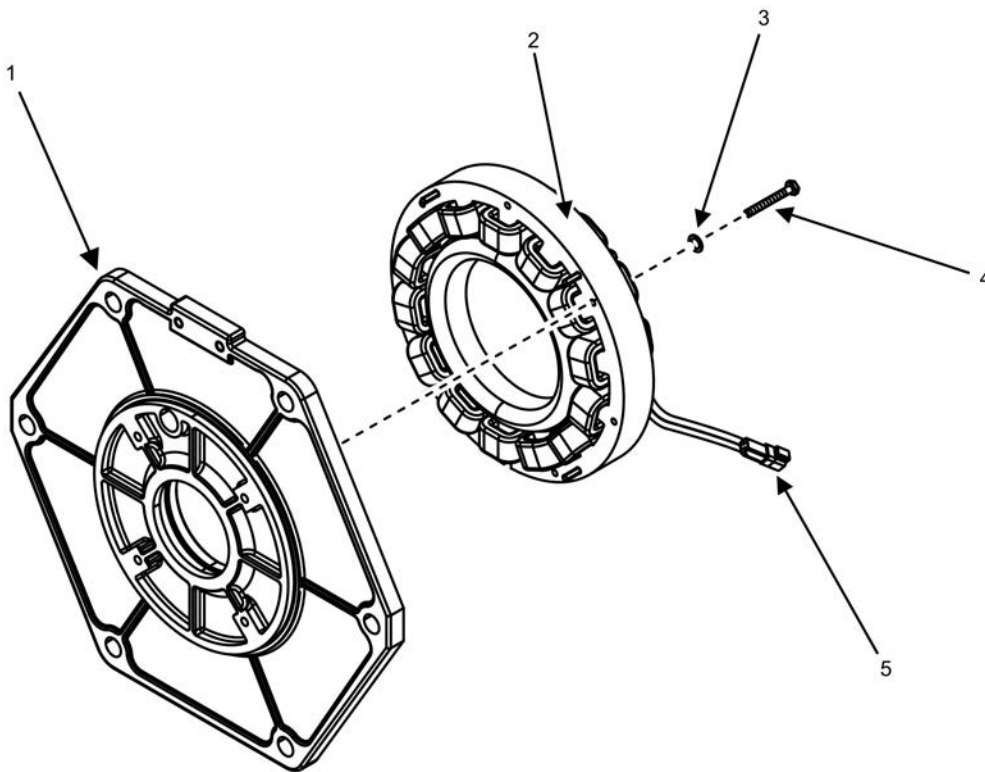
Insulation resistance value of exciter stator (Figure 2, Item 9) to ground obtained in step 7 should be at least  $1 M\Omega$ .

7. Observe and record insulation resistance.

8. Compare resistance values obtained in step 4 and step 7 to specifications to determine if exciter stator (Figure 2, Item 9) is serviceable.
  - a. Proceed to Replace Exciter Stator task if step 8 indicates that exciter stator (Figure 2, Item 9) is not serviceable.
  - b. Set end bell (Figure 2, Item 1) and exciter stator (Figure 2, Item 9) aside for installation if serviceable.
9. Proceed to Remove Rectifier task.

## END OF TASK

### Replace Exciter Stator



**Figure 4. 50/60 Hz Exciter Stator — Removal.**

1. Note orientation of P90 wiring plug (Figure 4, Item 5) wires to aid with installation.
2. Remove four bolts (Figure 4, Item 4) and four lock washers (Figure 4, Item 3) that attach exciter stator winding (Figure 4, Item 2) to end bell (Figure 4, Item 1). Discard lock washers.
3. Discard four lock washers (Figure 4, Item 3).
4. Remove exciter stator (Figure 4, Item 2) from end bell (Figure 4, Item 1).
5. Examine machined surface of end bell (Figure 4, Item 1) for corrosion, dirt, and debris where exciter stator (Figure 4, Item 2) makes contact. Clean as required.
6. Perform Test Exciter Stator Winding task on new exciter stator (Figure 4, Item 2).
7. Examine mating surface of new exciter stator (Figure 4, Item 2) visually where it will contact end bell (Figure 4, Item 1).

8. Remove any material from surface of exciter stator (Figure 4, Item 2) that will interfere with mating surfaces of end bell (Figure 4, Item 1).
9. Place exciter stator (Figure 4, Item 2) onto end bell (Figure 4, Item 1) using correct P90 wiring plug (Figure 4, Item 5) orientation noted in step 1.
10. Align holes in exciter stator (Figure 4, Item 2) with matching holes in end bell (Figure 4, Item 1).
11. Position four bolts (Figure 4, Item 4) and four new lock washers (Figure 4, Item 3) to attach exciter stator (Figure 4, Item 2) to end bell (Figure 4, Item 1).
12. Tighten bolts (Figure 4, Item 4) to torque value of 8 ft/lb (10 Nm).
13. Set end bell (Figure 4, Item 1) and exciter stator (Figure 4, Item 2) aside for installation.

## END OF TASK

### Remove Rectifier

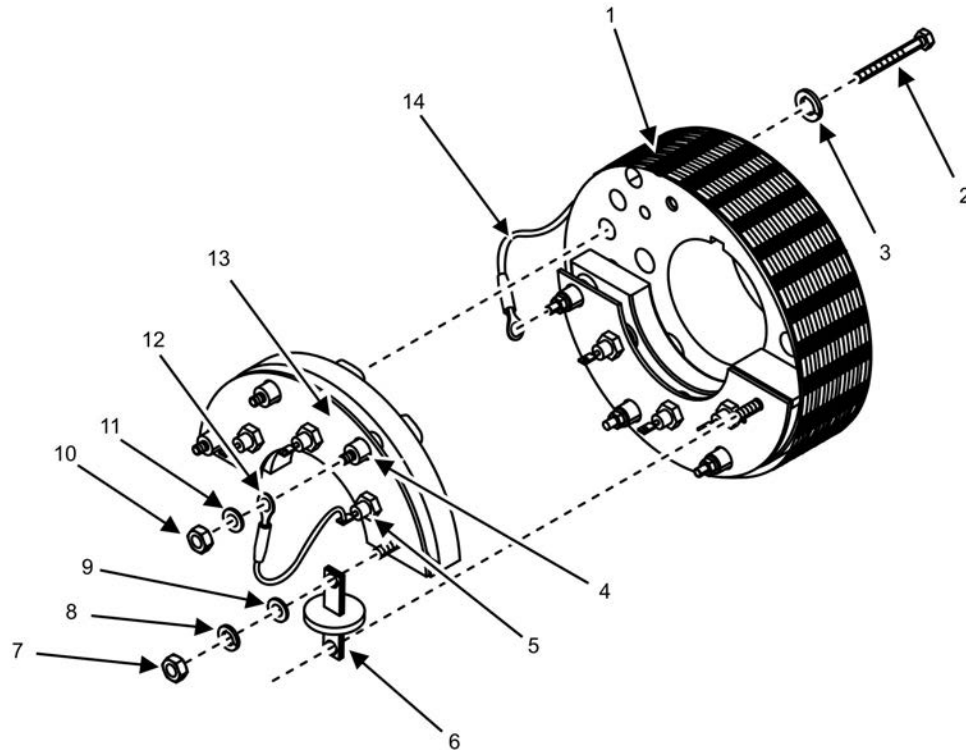


Figure 5. 50/60 Hz Rectifier Removal — Detail.

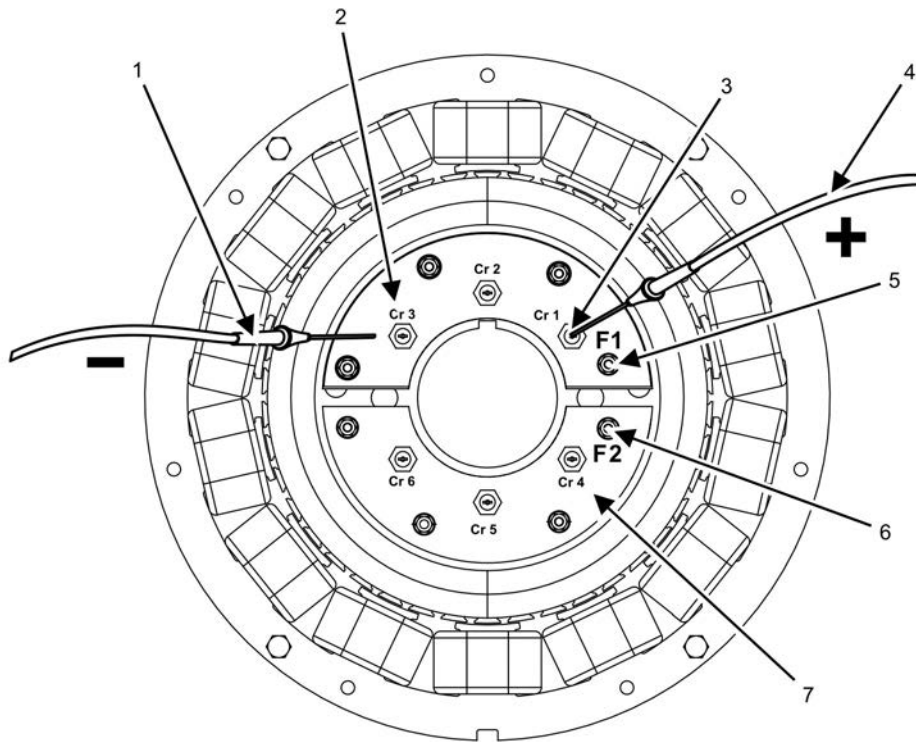
## CAUTION

If F1+ and F2- rectifier plates (Figure 5, Item 13) and Cr1 through Cr6 diodes are not marked as shown in (Figure 6), identify and mark or tag each lead before or as it is removed. For polarity orientation, rectifier plate (Figure 5, Item 13) with red insulation diode wires (Figure 5, Item 12) is identified as F1+. Rectifier plate (Figure 5, Item 13) with black insulation diode wires (Figure 5, Item 12) is identified as F2-. Failure to comply may cause damage to equipment.

## NOTE

Rectifier (Figure 5) is mounted on inside of exciter rotor (Figure 5, Item 1). Although rectifier (Figure 5) may be tested while installed, the recommended method to ensure accurate measurements is to remove each rectifier plate (Figure 5, Item 13) for testing.

1. Mark or tag orientation of each rectifier plate (Figure 5, Item 13).
2. Mark or tag each wire (Figure 5, Item 12 and 14) as it is loosened and/or removed from terminal studs (Figure 5, Item 4) to aid with installation.



**Figure 6. Test 50/60 Hz Rectifier.**

3. Remove nut (Figure 5, Item 7), lock washer (Figure 5, Item 8), flat washer (Figure 5, Item 9), and F1+ wire from F1+ terminal stud (Figure 6, Item 5).
4. Remove nut (Figure 5, Item 7), lock washer (Figure 5, Item 8), flat washer (Figure 5, Item 9), and F2- wire from F2- terminal stud (Figure 6, Item 6).
5. Discard lock washers (Figure 5, Item 8).
6. Remove surge suppressor (Figure 5, Item 6) and set aside on suitable work surface for testing.

## NOTE

Insulated wire connecting each diode to terminal stud (Figure 5, Item 4) is soldered at diode terminal (Figure 5, Item 5). After removing lock nut (Figure 5, Item 10), washer (Figure 5, Item 11), and exciter rotor wire (Figure 5, Item 14) from each terminal stud (Figure 5, Item 4), diode wire (Figure 5, Item 12) may remain loosely attached to terminal stud (Figure 5, Item 4).

7. Remove lock nut (Figure 5, Item 10) and washer (Figure 5, Item 11) from diode terminal stud (Figure 5, Item 4) corresponding to diode Cr1 (Figure 6, Item 3).
8. Separate exciter rotor wire (Figure 5, Item 14) from terminal stud (Figure 5, Item 4) corresponding to diode Cr1 (Figure 6, Item 3).
9. Discard lock nut (Figure 5, Item 10).
10. Repeat steps 7 through 9 for remaining diodes on F1+ rectifier plate (Figure 6, Item 2).
11. Remove bolts (Figure 5, Item 2) and lock washers (Figure 5, Item 3) from F1+ rectifier plate (Figure 6, Item 2). Discard lock washers (Figure 5, Item 3).
12. Remove F1+ rectifier plate (Figure 6, Item 2) and place on suitable work surface for testing.
13. Repeat steps 7 through 11 for F2- rectifier plate (Figure 6, Item 7).
14. Remove F2- rectifier plate (Figure 6, Item 7) and place on suitable work surface for testing.
15. Mark or tag each diode terminal (Figure 5, Item 5) and terminal stud (Figure 6, Items 5 and 6) on F1+ rectifier plate (Figure 6, Item 2) and F2- rectifier plate (Figure 6, Item 7) according to Figure 6.

## END OF TASK

### Inspect Rectifier and Surge Suppressor

1. Inspect rectifier plates (Figure 6, Items 2 and 7) for signs of corrosion, heat, or other damage. Replace as required.
2. Inspect surge suppressor (Figure 5, Item 6) for signs of corrosion, heat, or other damage. Replace as required.

## END OF TASK

### Test Rectifier

## CAUTION

Both F1+ and F2- rectifier plates (Figure 6, Items 2 and 7) must be replaced if either rectifier plate (Figure 6, Item 2 or 7) or any diode fails testing. Failure to comply may cause damage to equipment.

1. Select Ohms resistance function on multimeter (Figure 3, Item 4).
2. Touch negative meter probe (Figure 6, Item 1) to F1+ rectifier plate (Figure 6, Item 2) and positive meter probe (Figure 6, Item 4) to diode terminal on diode Cr1 (Figure 6, Item 3). Observe and record resistance value.
3. Touch positive meter probe (Figure 6, Item 4) to F1+ rectifier plate (Figure 6, Item 2) and negative meter probe (Figure 6, Item 1) to diode terminal on diode Cr1 (Figure 6, Item 3). Observe and record resistance value.
4. Repeat steps 2 and 3 for diodes Cr2 and Cr3 (Figure 6).

5. Touch negative meter probe (Figure 6, Item 1) to F2- rectifier plate (Figure 6, Item 7) and positive meter probe (Figure 6, Item 4) to diode terminal on diode Cr4 (diode Cr1 (Figure 6, Item 3) shown). Observe and record resistance value.
6. Touch positive meter probe (Figure 6, Item 4) to F2- rectifier plate (Figure 6, Item 7) and negative meter probe (Figure 6, Item 1) to diode terminal on diode Cr4 (diode Cr1 (Figure 6, Item 3) shown). Observe and record resistance value.
7. Repeat steps 5 and 6 for diodes Cr5 and Cr6 (Figure 6).

### NOTE

Resistance value obtained in step 2 and step 6 should be  $240\text{ k}\Omega \pm 10\%$  and resistance value obtained in step 3 and step 5 should be greater than  $2.4\text{ M}\Omega$ .

Resistance value obtained in step 3 and step 5 will typically be infinite resistance.

8. Compare resistance values obtained in step 2 through step 7 to specifications to determine if rectifier plates (Figure 6, Items 2 and 7) are serviceable.
9. Set rectifier plates (Figure 6, Items 2 and 7) aside for installation if serviceable or replace as required.

### END OF TASK

#### Test Surge Suppressor

1. Select Ohms resistance function on multimeter (Figure 3, Item 4).
2. Touch positive meter probe (Figure 3, Item 3) to either connection point of surge suppressor (Figure 5, Item 6).
3. Touch negative meter probe (Figure 3, Item 5) to opposite connection point of surge suppressor (Figure 5, Item 6). Observe and note resistance value.
4. Reverse points of contact with meter probes (Figure 3, Items 3 and 5). Observe and note resistance value.

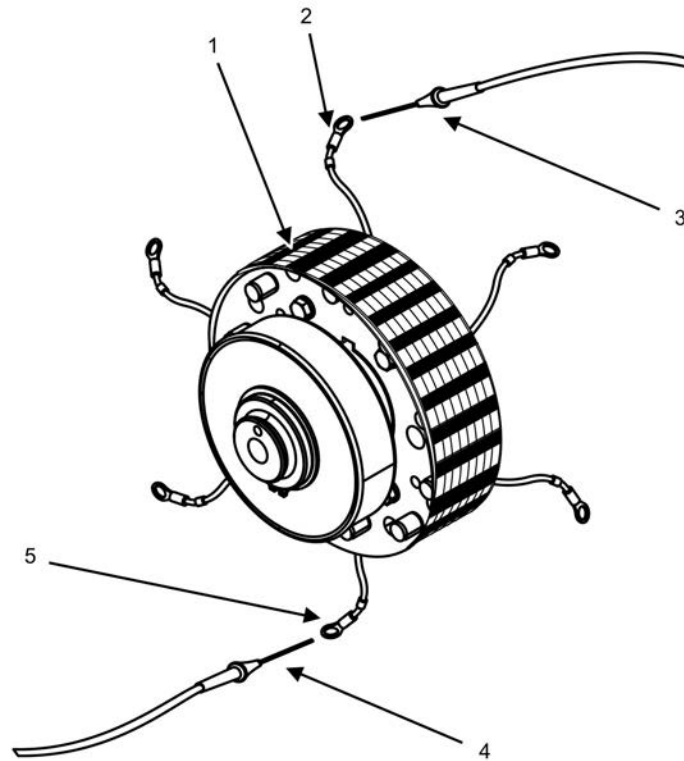
### NOTE

Resistance value of surge suppressor (Figure 5, Item 6) should be equal when measured front-to-back and back-to-front. An acceptable value is greater than  $1\text{ M}\Omega$ , and the measured value will typically be infinite resistance.

5. Compare resistance values obtained in step 3 and step 4 to specifications to determine if surge suppressor (Figure 5, Item 6) is serviceable.
6. Set surge suppressor (Figure 5, Item 6) aside for installation if serviceable or replace as required.

### END OF TASK

## Test Exciter Rotor Winding



**Figure 7. 50/60 Hz Exciter Rotor Wire Arrangement.**

### NOTE

Exciter rotor wires (Figure 7, Item 2 and 5) are paired according to a specific order. The order of pairs is: Cr1 to Cr6, Cr2 to Cr5, and Cr3 to Cr4. Pairs of wires may also be determined by noting that each individual wire of a pair will be located 180 degrees opposite the other.

1. Identify each of six numbered exciter rotor wire (Figure 7, Item 2 and 5) terminals.
2. Select Ohms resistance function on multimeter (Figure 3 Item 4).
3. Touch either meter probe (Figure 7, Item 3 or 4) to exciter rotor wire (Figure 7, Item 2 or 5) terminal identified as Cr1.
4. Touch second meter probe (Figure 7, Item 3 or 4) to exciter rotor wire (Figure 7, Item 2 or 5) terminal identified as Cr4.
5. Observe and record value of resistance.
6. Repeat steps 3 through 5 for remaining ordered pairs of exciter rotor wires (Figure 7, Item 2 and 5).
7. Touch either meter probe (Figure 7, Item 3 or 4) to exciter rotor wire (Figure 7, Item 2 or 5) terminal identified as Cr1.
8. Touch second meter probe (Figure 7, Item 3 or 4) to bare metal area (ground) of exciter rotor (Figure 7, Item 1).
9. Observe and record value of resistance.
10. Repeat steps 7 through 9 for remaining exciter rotor wire (Figure 7, Item 2) terminals tagged or marked as Cr2 and Cr3.

## NOTE

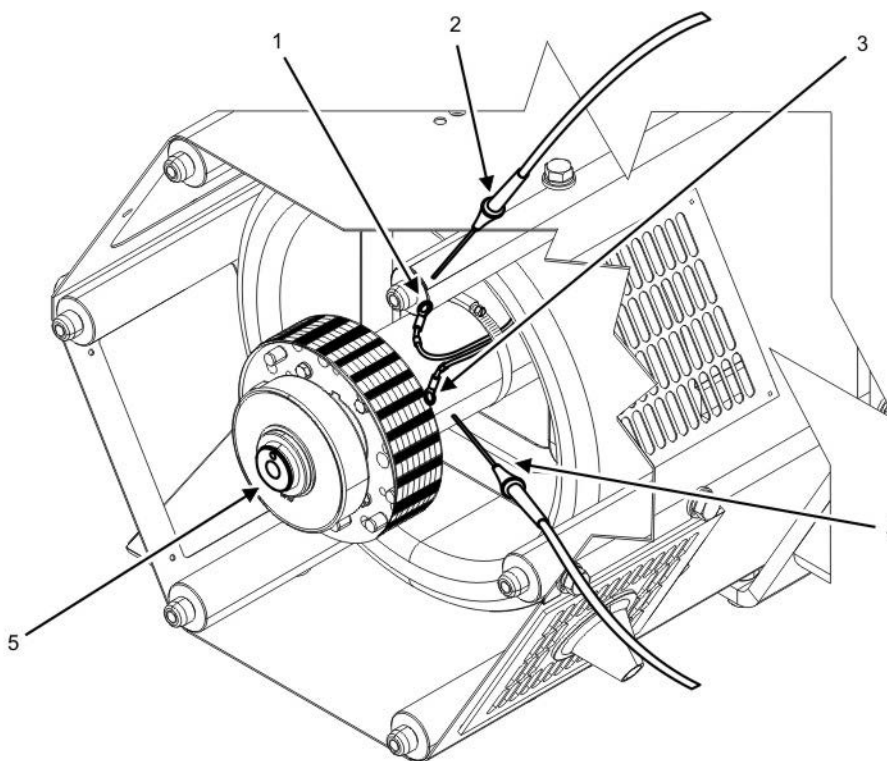
Resistance values obtained in steps 3 through 6 should be  $0\Omega$  ~~to~~  $\pm 10\%$ . Accuracy of a multimeter (Figure 3 Item 4) is unreliable when measuring values lower than  $1\Omega$ . Measurement value of infinity or more than  $1\Omega$  for any pair of wires indicates a defective exciter rotor (Figure 7, Item 1).

Resistance values obtained in step 7 through 10 of each wire to ground should be at least  $1\text{ M}\Omega$ .

11. Compare resistance values obtained in steps 3 through 6 and steps 7 through 10 to specifications to determine if exciter rotor (Figure 7, Item 1) is serviceable.
12. Proceed to Test Generator Rotor Winding task if exciter rotor (Figure 7, Item 1) is serviceable.

## END OF TASK

### Test Generator Rotor Winding



**Figure 8. Test 50/60 Hz Generator Rotor Winding — Detail.**

1. Identify generator rotor wires tagged or marked F1+ (Figure 8, Item 1 or 3) and F2- (Figure 8, Item 1 or 3) during Remove Rectifier task, steps 3 and 4.
2. Select Ohms resistance function on multimeter (Figure 3, Item 4).
3. Touch either meter probe (Figure 8, Item 2 or 5) to F1+ generator rotor wire (Figure 8, Item 1 or 3) terminal.
4. Touch second meter probe (Figure 8, Item 2 or 5) to F2- generator rotor wire (Figure 8, Item 1 or 3) terminal.
5. Observe and record value of resistance.
6. Touch either meter probe (Figure 8, Item 2 or 5) to F1+ generator rotor wire (Figure 8, Item 1 or 3) terminal.



7. Touch second meter probe (Figure 8, Item 2 or 5) to bare metal area (ground) of generator rotor (Figure 8, Item 5).
8. Observe and record value of resistance.

### NOTE

Resistance value obtained in steps 3 through 5 should be  $0.65\Omega \pm 10\%$ . Accuracy of a multimeter (Figure 3 Item 4) is unreliable when measuring values lower than  $1\Omega$ . Measurement value of infinity or more than  $1\Omega$  indicates a defective generator rotor.

Resistance value obtained in step 6 through 8 of generator rotor winding to ground should be at least  $1\text{ M}\Omega$ .

9. Compare resistance values obtained in steps 3 through 5 and steps 6 through 8 to specifications to determine if generator rotor winding is serviceable.
10. Proceed to Test Generator Stator Winding task if generator rotor winding is serviceable.

### END OF TASK

### Test Generator Stator Winding

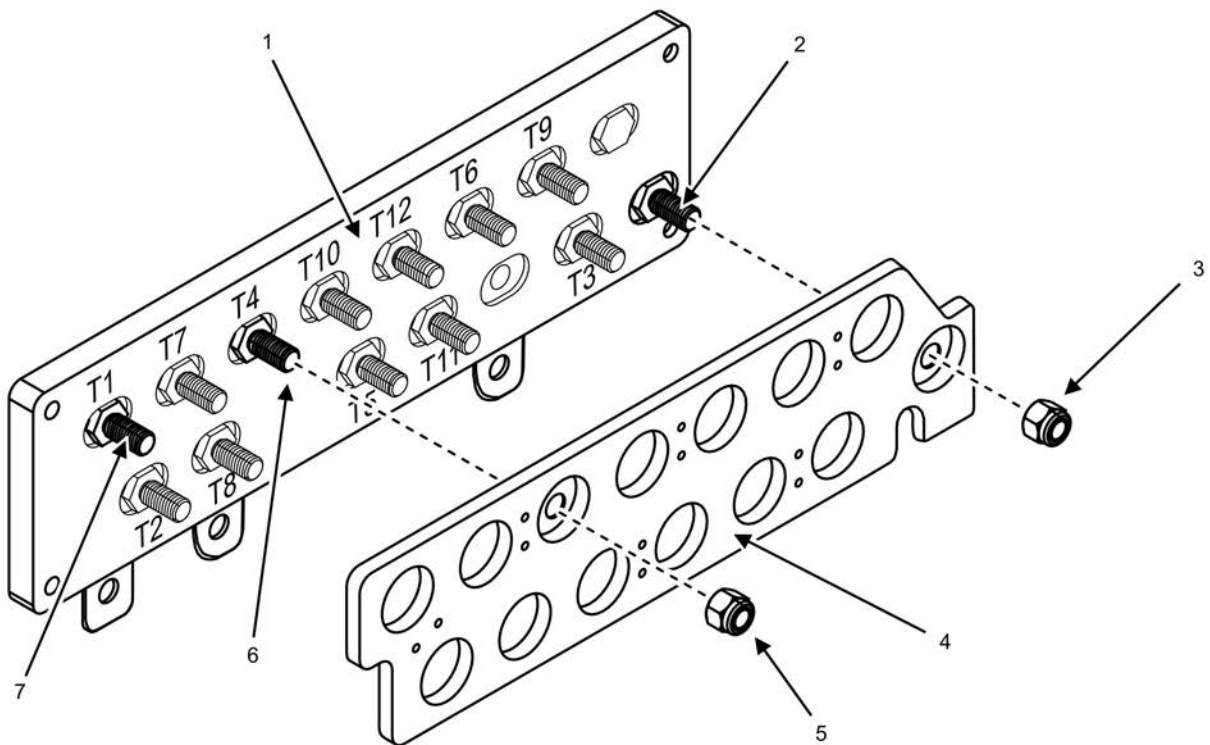


Figure 9. Test 50/60 Hz Generator Stator Winding.

## NOTE

Generator stator output wire connections and T1 through T12 markings are not visible from the front of voltage selection board. T1 through T12 markings are shown for identifying generator stator output wire connections from the front. The order of stator output wire connections is: T1 – T4, T2 – T5, T3 – T6, T7 – T10, T8 – T11, and T9 – T12.

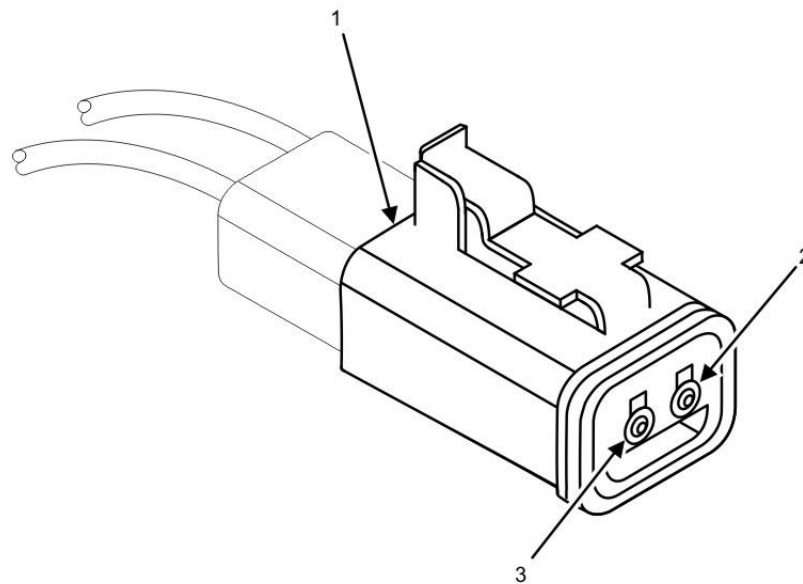
1. Note voltage selected position on voltage selection moveable board (Figure 9, Item 4) to aid with installation.
2. Remove 12 lock nuts (Figure 9, Item 5) that make electrical connection of voltage selection board (Figure 9, Item 1).
3. Remove one lock nut (Figure 9, Item 3) that makes mechanical connection of voltage selection board (Figure 9, Item 1).
4. Discard lock nuts (Figure 9, Item 3 and 5).
5. Remove voltage selection moveable board (Figure 9, Item 4) and set aside for installation.
6. Select Ohms resistance function on multimeter (Figure 3, Item 4).
7. Touch either meter probe (Figure 3, Item 3 or 5) to reconnection stud marked T1 (Figure 9, Item 7).
8. Touch second meter probe (Figure 3, Item 3 or 5) to reconnection stud marked T4 (Figure 9, Item 6).
9. Observe and record value of resistance.
10. Repeat steps 7 through 9 for remaining reconnection studs.
11. Touch either meter probe (Figure 3, Item 3 or 5) to reconnection stud marked T1 (Figure 9, Item 7).
12. Touch second meter probe (Figure 3, Item 3 or 5) to bare metal area (ground) of generator stator (Figure 2, Item 3).
13. Observe and record value of resistance.
14. Repeat steps 11 through 13 for reconnection studs marked T2, T3, T7, T8, and T9.

## NOTE

Resistance values obtained in steps 7 through 9 should be  $0.0796 \Omega \pm 10\%$ . Accuracy of a multimeter (Figure 3 Item 4) is unreliable when measuring values lower than  $1 \Omega$ . Measurement value of infinity or more than  $1 \Omega$  for any pair of wires indicates a defective generator stator (Figure 2, Item 3).

Resistance values obtained in steps 11 through 14 of each reconnection stud to ground should be at least  $1 M\Omega$ .

15. Compare resistance values obtained in steps 7 through 9 and steps 11 through 14 to specifications to determine if generator stator (Figure 2, Item 3) is serviceable.
16. Locate and disconnect Q1/Q2 wiring plug (Figure 10 Item 1) at wire port in generator stator (Figure 2, Item 3).
17. Select Ohms resistance function on multimeter (Figure 3, Item 4).
18. Touch either meter probe (Figure 3, Item 3 or 5) to either wiring plug (Figure 10, Item 1) connector (Figure 10, Item 2 or 3).
19. Touch second meter probe (Figure 3, Item 3 or 5) to second wiring plug (Figure 10, Item 1) connector (Figure 10, Item 2 or 3).
20. Observe and record value of resistance.
21. Touch either meter probe (Figure 3, Item 3 or 5) to either wiring plug (Figure 10, Item 1) connector (Figure 10, Item 2 or 3).



**Figure 10. Test 50/60 Hz Generator Stator Q1/Q2 Winding — Detail.**

22. Touch second meter probe (Figure 3, Item 3 or 5) to bare metal area (ground) of generator stator (Figure 2, Item 3).
23. Observe and record value of resistance.

### **NOTE**

Resistance value obtained in steps 15 through 17 should be  $0.571 \Omega \pm 10\%$ . Accuracy of a multimeter is unreliable when measuring values lower than  $1 \Omega$ . A measurement value greater than  $1 \Omega$  for any pair of wires indicates a defective generator stator (Figure 2, Item 3).

Resistance value obtained in steps 18 through 20 to ground should be at least  $1 M\Omega$ .

24. Compare resistance values obtained in steps 15 through 17 and steps 18 through 20 to specifications to determine if generator stator (Figure 2, Item 3) is serviceable.
25. Complete Assemble Voltage Selection Board task if generator stator (Figure 2, Item 3) is serviceable.

### **END OF TASK**

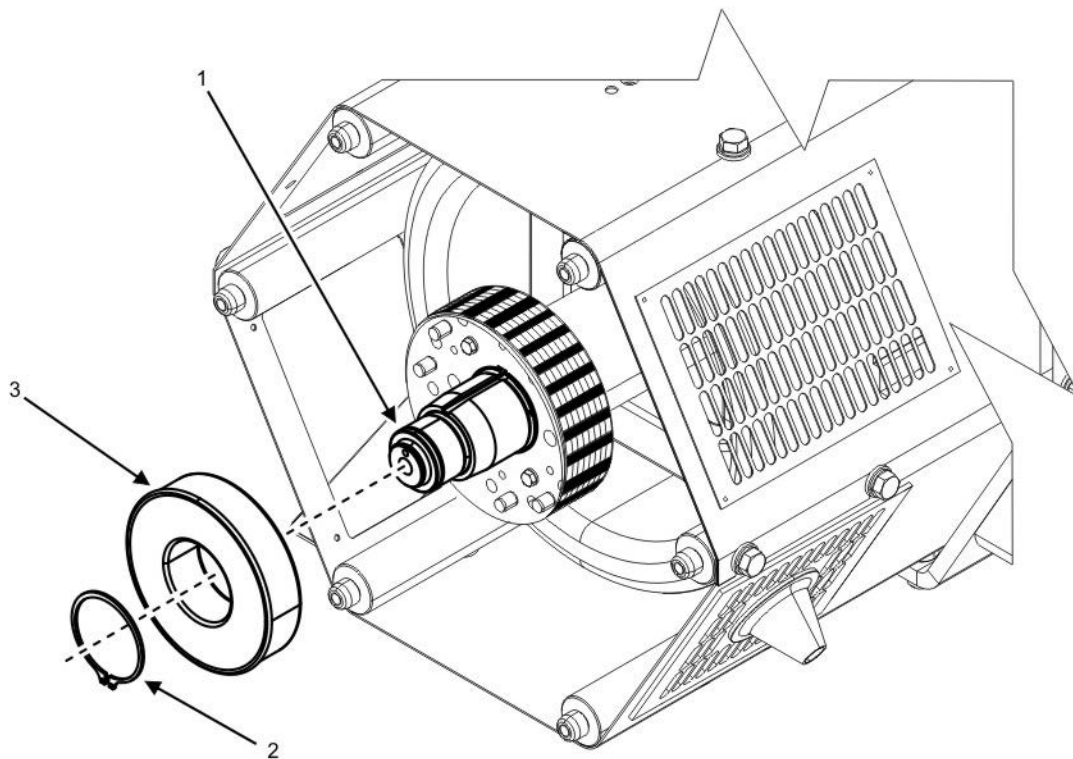
#### **Assemble Voltage Selection Board**

1. Place voltage selection moveable board (Figure 9, Item 4) onto voltage selection board (Figure 9, Item 1) at voltage selected position noted in Test Generator Stator Winding, step 1.
2. Position 13 new lock nuts (Figure 9, Item 3 and 5) onto reconnection studs (Figure 9, Item 2, 6, and 7).
3. Tighten nuts (Figure 9, Item 3 and 5) to torque value of 22-27 in/lb (10-12 Nm).

### **END OF TASK**

#### **Inspect Bearing**

1. Examine bearing (Figure 11, Item 3) for discoloration and corrosion that are signs of heat and contamination damage.



**Figure 11. 50/60 Hz Generator Bearing Removal — Detail.**

2. Touch outer race of bearing (Figure 11, Item 3) lightly with fingertips and rotate slowly in a back-and-forth motion to feel and listen for any signs of roughness and/or lack of lubrication.
3. Proceed to Replace Bearing task if any signs of damage are found or if bearing (Figure 11, Item 3) does not rotate freely.

#### **END OF TASK**

#### **Replace Bearing**

1. Remove and discard retaining ring (Figure 11, Item 2).
2. Attach bearing puller to bearing (Figure 11, Item 3).

#### **CAUTION**

When a bearing (Figure 11, Item 3) is removed for any reason, always install a new bearing (Figure 11, Item 3). Failure to comply may cause damage to equipment.

3. Remove bearing (Figure 11, Item 3) from generator rotor shaft (Figure 11, Item 1).
4. Clean bearing surface of generator rotor shaft (Figure 11, Item 1).
5. Press new bearing (Figure 11, Item 3) onto generator rotor shaft (Figure 11, Item 1).
6. Install new retaining ring (Figure 11, Item 2) onto generator rotor shaft (Figure 11, Item 1).

#### **END OF TASK**

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**Install End Bell**

1. Perform Test Rectifier task on new rectifier plates (Figure 6, Item 2 and 7).
2. Align holes in F1+ rectifier plate (Figure 5, Item 13) with holes in exciter rotor (Figure 5, Item 1) according to tag or mark placed during Remove Rectifier task, step 1.
3. Position two bolts (Figure 5, Item 2) and two lock washers (Figure 5, Item 3) that attach F1+ rectifier plate (Figure 5, Item 13) to exciter rotor (Figure 5, Item 1).
4. Repeat step 2 and 3 for F2- rectifier plate (Figure 6, Item 7).
5. Tighten four bolts (Figure 5, Item 2) to torque value of 7.80 ft/lb (10.4 Nm).
6. Perform Test Surge Suppressor task on new surge suppressor (Figure 5, Item 6).
7. Place surge suppressor (Figure 5, Item 6) onto F1+ terminal stud (Figure 6, Item 5) and F2- terminal stud (Figure 6, Item 6).
8. Place F1+ generator rotor wire marked or tagged during Remove Rectifier task, step 2 and 3 onto F1+ terminal stud (Figure 6, Item 5).
9. Install flat washer (Figure 5, Item 9), new lock washer (Figure 5, Item 8), and nut (Figure 5, Item 7) onto F1+ terminal stud (Figure 6, Item 5).
10. Place F2- generator rotor wire marked or tagged during Remove Rectifier task, step 2 and 3 onto F2- terminal stud (Figure 6, Item 6).
11. Install flat washer (Figure 5, Item 9), new lock washer (Figure 5, Item 8), and nut (Figure 5, Item 7) onto F2- terminal stud (Figure 6, Item 6).
12. Place exciter rotor wire (Figure 5, Item 14) tagged or marked Cr1 onto diode tagged or marked Cr1 (Figure 6, Item 3).
13. Install flat washer (Figure 5, Item 11) and new lock nut (Figure 5, Item 10) onto diode tagged or marked Cr1 (Figure 6, Item 3).
14. Repeat steps 7 and 8 for remaining exciter rotor wires (Figure 5, Item 14) and diodes tagged or marked Cr2 through Cr6.
15. Remove tags or marks that will interfere with generator operation.
16. Insert P90 wiring plug (Figure 2, Item 6) through grommet (Figure 2, Item 4) in generator stator (Figure 2, Item 3).

**WARNING**

Component being lifted weighs approximately 46 lb (21 kg). Two personnel or suitable lifting device is necessary to lift component. Failure to comply may cause injury or death to personnel.

**CAUTION**

Use extreme caution when installing end bell (Figure 2, Item 1) onto generator stator (Figure 2, Item 3). End bell (Figure 2, Item 1) is awkward to handle and must be installed without any exciter stator (Figure 2, Item 9) contact with generator components. Failure to comply will cause damage to equipment.

**NOTE**

Assistance is required to perform step 17.

17. Align tag or mark on end bell (Figure 2, Item 1) with corresponding tag or mark on generator stator (Figure 2, Item 3).

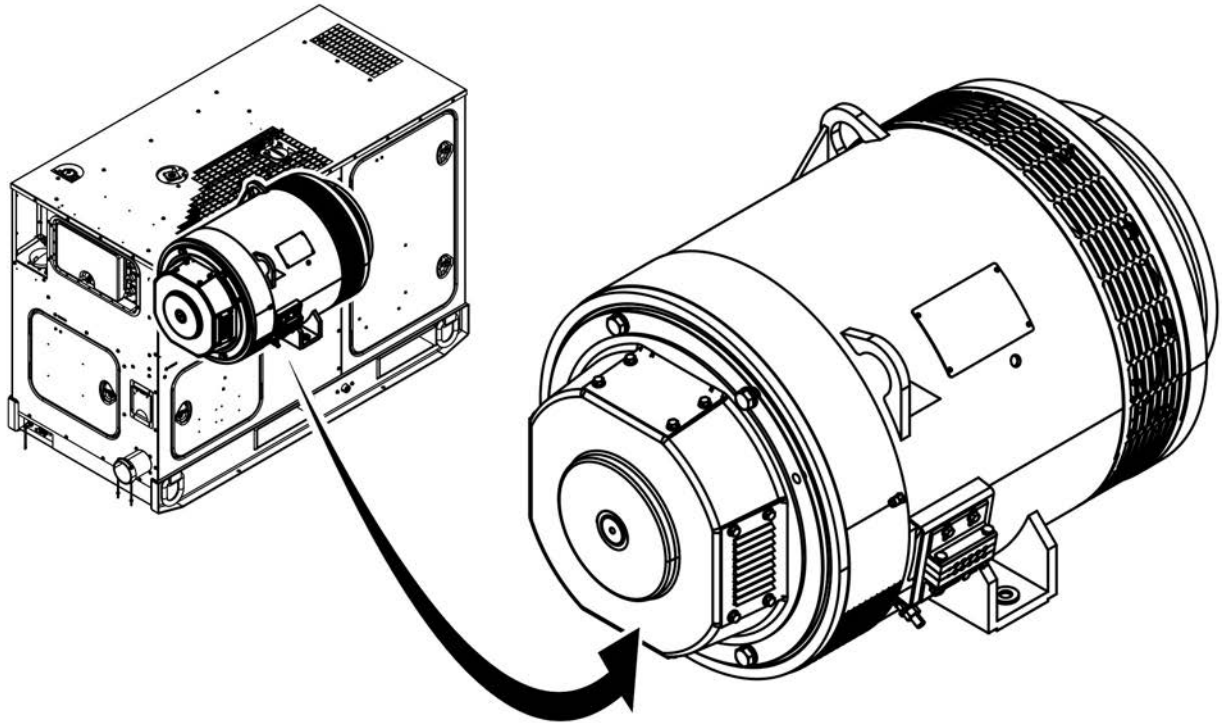
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**NOTE**

End bell (Figure 2, Item 1) may resist installation onto bearing (Figure 2, Item 2). Use a tool that will not damage end bell (Figure 2, Item 1) to tap various points around outside of bearing mating surface until bolts can be engaged into generator stator (Figure 2, Item 3).

18. Push end bell (Figure 2, Item 1) bearing mating surface evenly onto bearing (Figure 2, Item 2) until bolts (Figure 2, Item 8) can be engaged in generator stator (Figure 2, Item 3).
19. Position six bolts (Figure 2, Item 8), six new lock washers (Figure 2, Item 7), and six flat washers (Figure 2, Item 9) into each mounting hole until threads are engaged.
20. Tighten each bolt (Figure 2, Item 8) gradually in crisscross sequence using the same number of turns each time for each bolt (Figure 2, Item 8) to draw end bell (Figure 2, Item 1) onto generator stator (Figure 2, Item 3).
21. Verify end bell (Figure 2, Item 1) machined surface has fully engaged generator stator (Figure 2, Item 3) machined surface.
22. See Remove End Bell task, steps 18 through 20, if end bell (Figure 2, Item 1) machined surface does not fully engage generator stator (Figure 2, Item 3) machined surface.
23. Examine generator bearing (Figure 2, Item 2) and end bell (Figure 2, Item 1) for indication of obstruction. Repair or replace as required.
24. Repeat steps 17 through 23 as required.
25. Tighten six bolts (Figure 2, Item 12) to torque value of 18 – 22 ft/lb (25 – 29 Nm).
26. Pull excess P90 wiring plug (Figure 2, Item 6) wires from grommet (Figure 2, Item 4) in generator stator (Figure 2, Item 3) to length tagged or marked in Remove End Bell task, step 17.
27. Feed P90 wiring plug (Figure 2, Item 6) and wires through generator output wire clamp (not shown).
28. Connect P90 wiring plug (Figure 2, Item 6) to connector (not shown).
29. Install fuel tank with fuel manifold attached (WP 0052, Remove/Install Fuel Tank).
30. Install interior panels (WP 0034, Remove/Install Interior Body Panels).
31. Connect coalescer return hose to underside of radiator support panel (WP 0034, Remove/Install Interior Body Panels).
32. Install right-side body panel (WP 0033, Remove/Install Right-Side Body Panels).
33. Connect coalescer return hose to top side of radiator support panel (WP 0034, Remove/Install Interior Body Panels).
34. Connect coalescer supply hose to coalescer (WP 0070, Remove/Install Coalescer).
35. Install coalescer cover (WP 0070, Remove/Install Coalescer).
36. Install filler neck (WP 0054, Remove/Install Fuel Tank Filler Neck).
37. Install fuel tank (WP 0052, Remove/Install Fuel Tank).
38. Install ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
39. Close generator set doors.
40. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
41. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
42. Repair as required.

**END OF TASK**

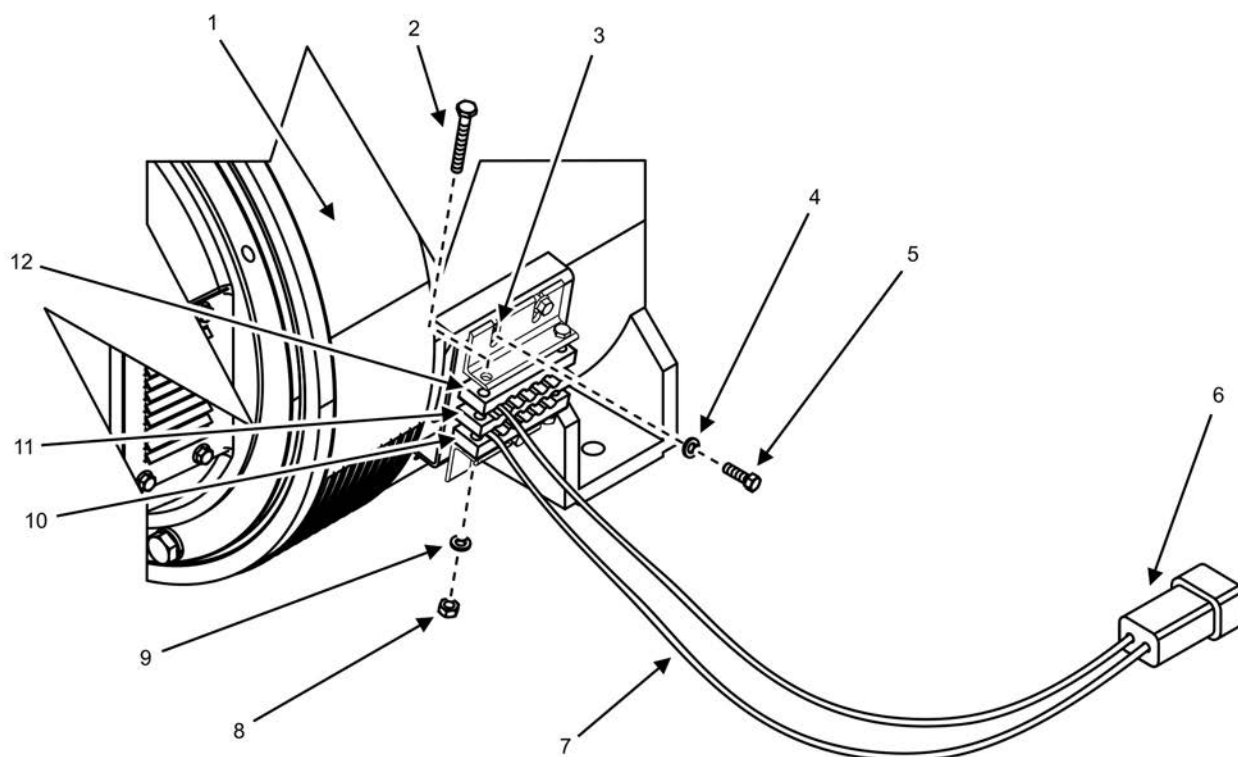
**TEST 400 HZ AC GENERATOR (UOC 98M)****Remove End Bell**

**Figure 12. 400 Hz AC Generator — Location.**

**NOTE**

Complete all generator and exciter rotor tests and all inspections of components attached to generator and exciter rotors before any replacement task is started.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate AC generator on set skid (Figure 12).
3. Remove coalescer cover (WP 0070, Remove/Install Coalescer).
4. Disconnect coalescer supply hose at coalescer (WP 0070, Remove/Install Coalescer).
5. Disconnect coalescer return hose from top side of radiator support panel (WP 0034, Remove/Install Interior Body Panels).
6. Remove right-side body panel (WP 0033, Remove/Install Right-Side Body Panels).

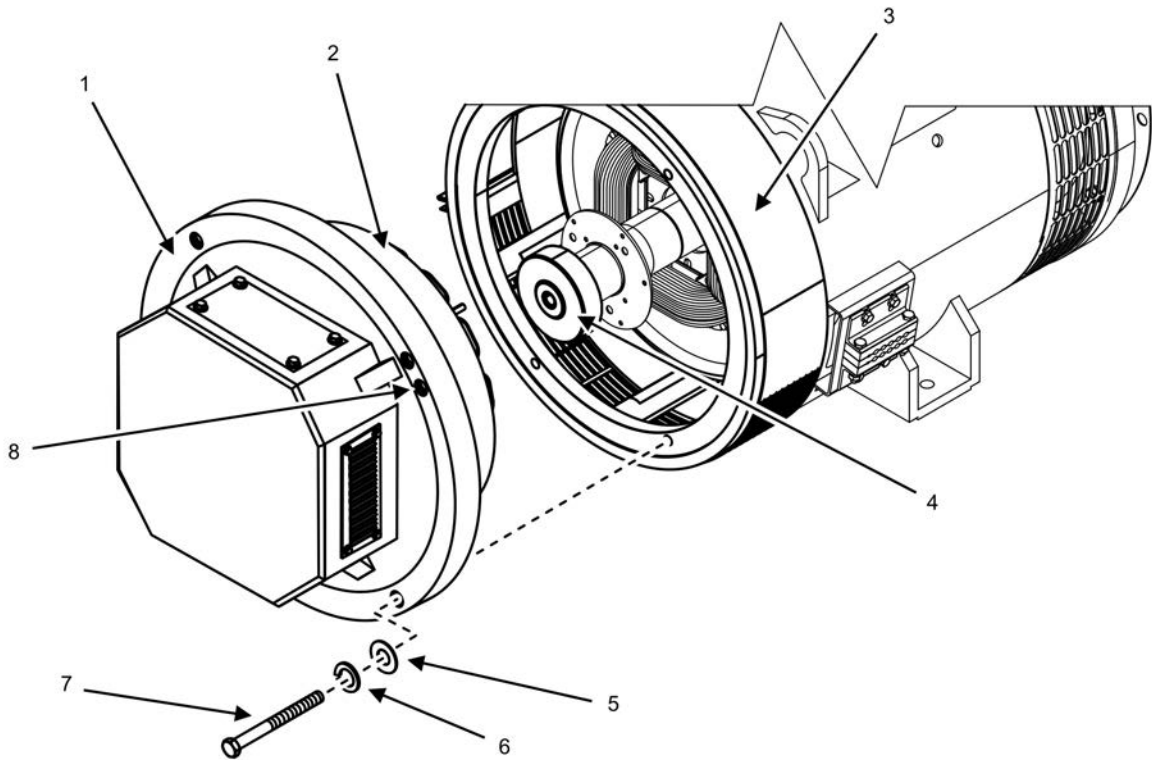


**Figure 13. 400 Hz Generator Wire Separator — Detail.**

7. Disconnect coalescer return hose from underside of radiator support panel (WP 0034, Remove/Install Interior Body Panels).
8. Remove interior panels (WP 0034, Remove/Install Interior Body Panels).
9. Remove fuel tank with fuel manifold attached (WP 0052, Remove/Install Fuel Tank).
10. Place tag or mark on P90 wiring plug wires (Figure 13, Item 7) to indicate length that wires extend from generator stator (Figure 13, Item 1).
11. Remove nut (Figure 13, Item 8), lock washer (Figure 13, Item 9), and bolt (Figure 13, Item 2) from left-hand side of wire separator (Figure 13).
12. Remove upper two bolts (Figure 13, Item 5) that attach upper wire separator bracket (Figure 13, Item 3) to generator stator (Figure 13, Item 1).
13. Discard three lock washers (Figure 13, Items 4 and 9).
14. Disconnect P90 wiring plug (Figure 13, Item 6) from connector (not shown) located adjacent to wire separator (Figure 13).
15. Note location of P90 wiring plug wires (Figure 13, Item 7) in grooves of wire separator insulators (Figure 13, Items 10, 11, and 12) to aid with installation.
16. Feed P90 wiring plug wires (Figure 13, Item 7) and P90 wiring plug (Figure 13, Item 6) through clamp (not shown) located adjacent to wire separator (Figure 13).
17. Loosen nut (Figure 13, Item 8) on bolt (Figure 13, Item 2) at right-hand side of wire separator (Figure 13).
18. Spread wire separator insulators (Figure 13, Items 10, 11 and 12) apart enough to withdraw P90 wiring plug (Figure 13, Item 6) and P90 wiring plug wires (Figure 13, Item 7) from wire separator (Figure 13).



19. Insert P90 wiring plug (Figure 13, Item 6) and P90 wiring plug wires (Figure 13, Item 7) into generator stator wire port (not shown) located behind wire separator (Figure 13).



**Figure 14. 400 Hz Generator End Bell — Removal.**

20. Place tag or mark on end bell (Figure 14, Item 1) and generator stator (Figure 14, Item 3) to note relative position of end bell (Figure 14, Item 1) to generator stator (Figure 14, Item 3).

### CAUTION

Use extreme caution when removing end bell (Figure 14, Item 1) from generator bearing (Figure 14, Item 4). End bell (Figure 14, Item 1) is heavy and must be removed without any exciter stator (Figure 14, Item 2) contact with bearing (Figure 14, Item 4). Failure to comply will cause damage to equipment.

21. Remove four bolts (Figure 14, Item 7), four lock washers (Figure 14, Item 6), and four flat washers (Figure 14, Item 5) that attach end bell (Figure 14, Item 1) to generator stator (Figure 14, Item 3).
22. Discard lock washers (Figure 14, Item 6).
23. Position two bolts (Figure 14, Item 7) into jacking holes (Figure 14, Item 8) of end bell (Figure 14, Item 1) finger-tight.

## WARNING

The component being lifted weighs approximately 65 lb (30 kg). Two personnel or a suitable lifting device is necessary to lift component. Failure to comply may cause injury or death to personnel.

## NOTE

Assistance is required to perform steps 24 through 26.

24. Turn bolts (Figure 14, Item 7) alternately an equal number of turns in a clockwise direction until end bell (Figure 14, Item 1) is disengaged from generator stator (Figure 14, Item 3).
25. Withdraw P90 wiring plug (Figure 13, Item 6) and P90 wiring plug wires (Figure 13, Item 7) as end bell (Figure 14, Item 1) is disengaged from generator stator (Figure 14, Item 3).
26. Remove end bell (Figure 14, Item 1) and exciter stator (Figure 14, Item 2) and place on suitable work surface.
27. Remove bolts (Figure 14, Item 7) used as jacking bolts from end bell (Figure 14, Item 1).
28. Inspect end bell (Figure 14, Item 1), bolts (Figure 14, Item 7), and exciter stator (Figure 14, Item 2) for signs of metal fractures or fatigue, damaged threads, loose or broken wires, damaged insulation, excessive heat, and/or odor of burned insulation. Replace as required.

## END OF TASK

### Test Exciter Stator Winding

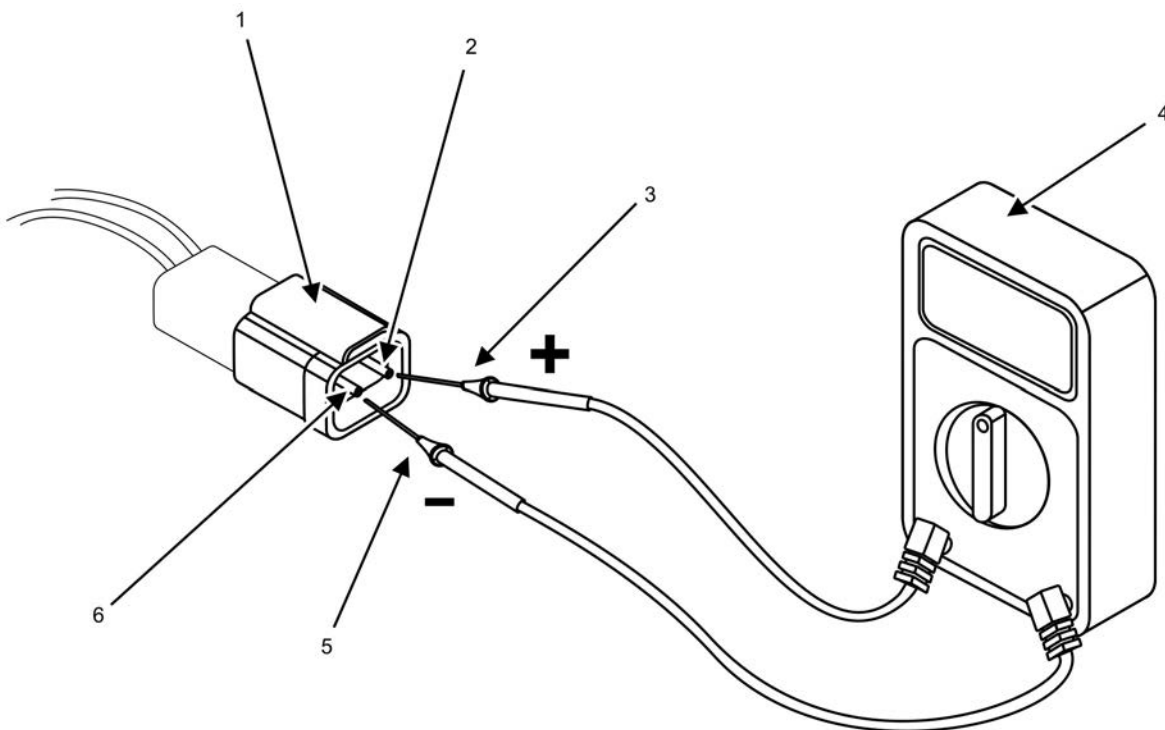


Figure 15. Test 400 Hz Exciter Stator Winding — Detail.

1. Select Ohms resistance function on multimeter (Figure 15, Item 4).

2. Touch either meter probe (Figure 15, Item 3 or 5) to either pin (Figure 15, Item 2 or 6) of P90 wiring plug (Figure 15, Item 1).
3. Touch second meter probe (Figure 15, Item 3 or 5) to second pin (Figure 15, Item 2 or 6) of P90 wiring plug (Figure 15, Item 1).
4. Observe and record value of resistance.
5. Touch either meter probe (Figure 15, Item 3 or 5) to either pin (Figure 15, Item 2 or 6) of P90 wiring plug (Figure 15, Item 1).
6. Touch second meter probe (Figure 15, Item 3 or 5) to bare metal area (ground) of exciter stator (Figure 14, Item 2).
7. Measure and note insulation resistance.

### NOTE

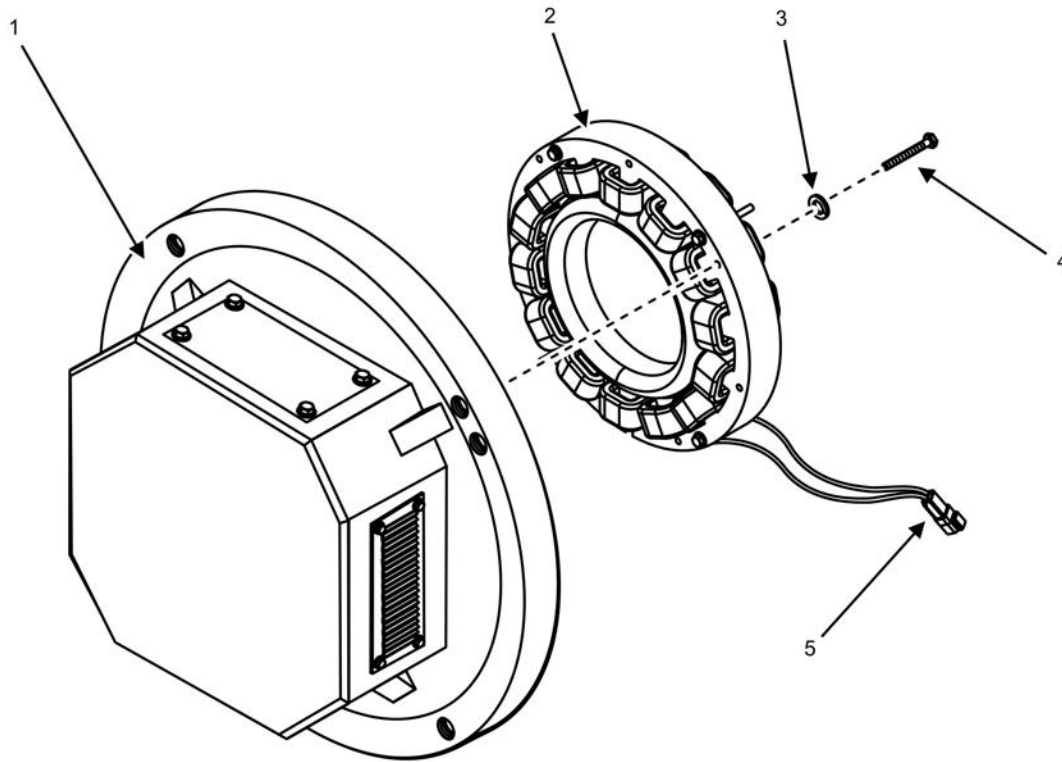
Resistance value of exciter stator (Figure 14, Item 2) obtained in step 4 should be  $23.5 \Omega \pm 10\%$  percent. A resistance value of zero indicates a shorted exciter stator (Figure 14, Item 2), and resistance value of infinity indicates an open exciter stator (Figure 14, Item 2).

Insulation resistance value of exciter stator (Figure 14, Item 2) to ground obtained in step 7 should be at least 1 M $\Omega$ .

8. Compare resistance values obtained in step 4 and step 7 to specifications to determine if exciter stator (Figure 14, Item 2) is serviceable.
  - a. Proceed to Replace Exciter Stator Winding task if resistance values measured indicate that exciter stator (Figure 14, Item 2) is not serviceable.
  - b. Set end bell (Figure 14, Item 1) and attached exciter stator (Figure 14, Item 2) aside for installation if it is serviceable.
9. Proceed to Inspect Rectifier task.

### END OF TASK

## Replace Exciter Stator Winding



**Figure 16. 400 Hz Exciter Stator Winding — Removal.**

1. Note orientation of P90 wiring plug (Figure 16, Item 5) wires to aid with installation.
2. Remove four bolts (Figure 16, Item 4) and four lock washers (Figure 16, Item 3) that attach exciter stator winding (Figure 16, Item 2) to end bell (Figure 16, Item 1).
3. Discard lock washers (Figure 16, Item 3).
4. Remove exciter stator winding (Figure 16, Item 2) from end bell (Figure 16, Item 1).
5. Examine machined surface of end bell (Figure 16, Item 1) for corrosion, dirt, and debris where exciter stator winding (Figure 16, Item 2) makes contact. Clean as required.
6. Perform Test Exciter Stator Winding task on new exciter stator winding (Figure 16, Item 2).
7. Visually examine mating surface of exciter stator winding (Figure 16, Item 2) where it will contact end bell (Figure 16, Item 1).
8. Remove any material from the surface of exciter stator winding (Figure 16, Item 2) that will interfere with mating surfaces of end bell (Figure 16, Item 1).
9. Place exciter stator winding (Figure 16, Item 2) onto end bell (Figure 16, Item 1) using correct P90 wiring plug (Figure 16, Item 5) wires orientation noted in step 1.
10. Align holes in exciter stator winding (Figure 16, Item 2) with matching holes in end bell (Figure 16, Item 1).
11. Position four bolts (Figure 16, Item 4) and four new lock washers (Figure 16, Item 3) to attach exciter stator winding (Figure 16, Item 2) to end bell (Figure 16, Item 1).
12. Tighten four bolts (Figure 16, Item 4) to a torque value of 7.80 ft/lb (10.4 Nm).

- 
13. Set end bell (Figure 16, Item 1) and attached exciter stator winding (Figure 16, Item 2) aside for installation.

**END OF TASK****Inspect Rectifier**

1. Inspect rectifier (Figure 17) for signs of corrosion, heat, or other damage.
2. Proceed to Test Rectifier task if rectifier (Figure 17) is not damaged.
3. Perform step a and b if rectifier (Figure 17) is damaged.
  - a. Complete Replace Bearing task, steps 1 through 3.
  - b. Complete Replace Rectifier task.

**END OF TASK****Test Rectifier****CAUTION**

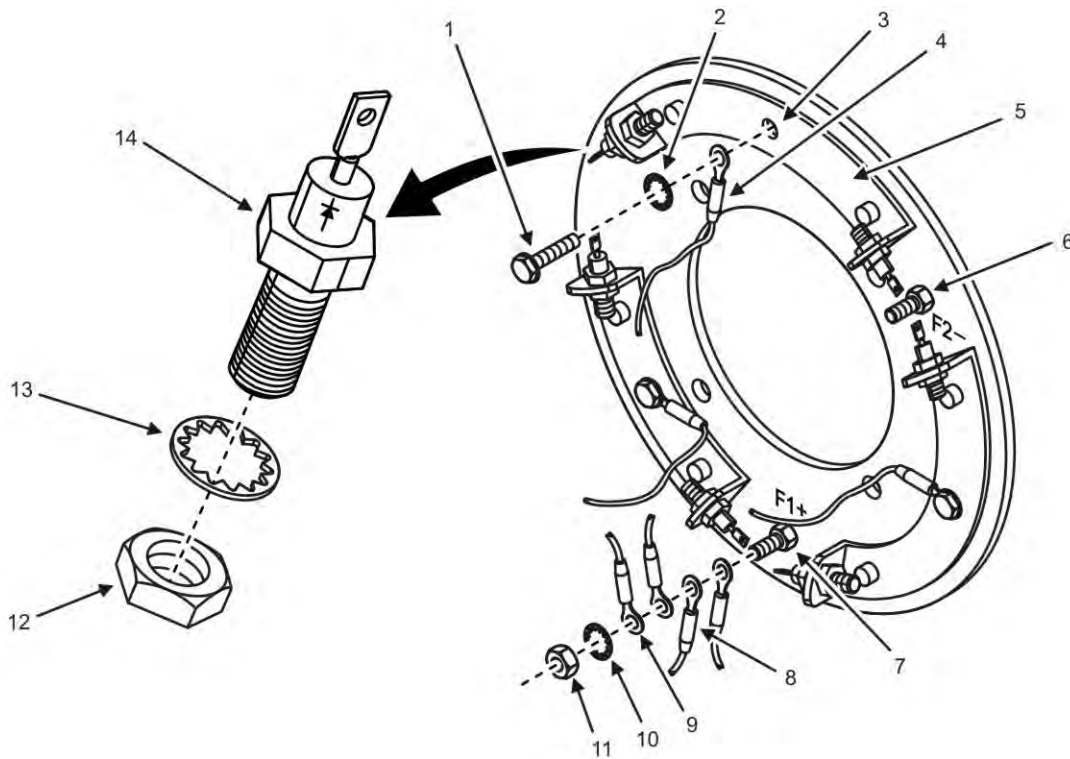
All diodes must be replaced if any diode fails testing. Failure to comply may cause damage to equipment.

**NOTE**

Rectifier (Figure 17) may be tested while installed. Physical arrangement of diodes (Figure 17, Item 14) on each of three rectifier connection plates (Figure 17, Item 5) is identical. Electrical arrangement of diodes (Figure 17, Item 14) is different.

When rectifier is positioned as shown in Figure 17, with first terminal stud (Figure 17, Item 7) at bottom and second terminal stud (Figure 17, Item 6) to the right and above first terminal stud (Figure 17, Item 7), designation of F1+ and F2- terminal studs (Figure 17, Items 6 and 7) may be marked and tagged.

1. Mark or tag three exciter rotor wires (Figure 17, Item 4) and connection points (Figure 17, Item 3) at each rectifier connection plate (Figure 17, Item 5) to aid with installation.



**Figure 17. 400 Hz Exciter Rotor Winding and Rectifier Test — Detail.**

2. Remove three bolts (Figure 17, Item 1) and three lock washers (Figure 17, Item 2) that attach exciter rotor wires (Figure 17, Item 4) to rectifier connection plates (Figure 17, Item 5).
3. Mark or tag diode wires (Figure 17, Item 8), F1+ generator rotor wire (Figure 17, Item 9), and terminal stud (Figure 17, Item 7) as F1+.
4. Remove nut (Figure 17, Item 11), lock washer (Figure 17, Item 10) and wires identified in step 3 as F1+ from F1+ terminal stud (Figure 17, Item 7).
5. Mark or tag diode wires (Figure 17, Item 8), F2- generator rotor wire (Figure 17, Item 9), and terminal stud (Figure 17, Item 6) as F2-.
6. Remove nut (Figure 17, Item 11), lock washer (Figure 17, Item 10), and wires identified in step 5 as F2- from F2- terminal stud (Figure 17, Item 6). Discard lock washers (Figure 17, Item 10).
7. Ensure exciter rotor wires (Figure 17, Item 4) and wires removed from F1+ and F2- terminal studs (Figure 17, Items 6 and 7) are not making contact with any metal components or each other.
8. Select Ohms resistance function on multimeter (Figure 15, Item 4).
9. Touch positive meter probe (Figure 15, Item 3) to either rectifier connection plate (Figure 17, Item 5) adjacent to terminal F1+ (Figure 17, Item 7).
10. Touch negative meter probe (Figure 15, Item 5) to soldered connection of either diode (Figure 17, Item 14) adjacent to terminal F1+ (Figure 17, Item 7). Observe and record resistance value.
11. Touch negative meter probe (Figure 15, Item 5) to either rectifier connection plate (Figure 17, Item 5) adjacent to terminal F1+ (Figure 17, Item 7).
12. Touch positive meter probe (Figure 15, Item 3) to soldered connection of either diode (Figure 17, Item 14) adjacent to terminal F1+ (Figure 17, Item 7). Observe and record resistance value.

13. Repeat steps 9 through 12 for remaining diodes (Figure 17, Item 14) attached to respective rectifier connection plates (Figure 17, Item 5).

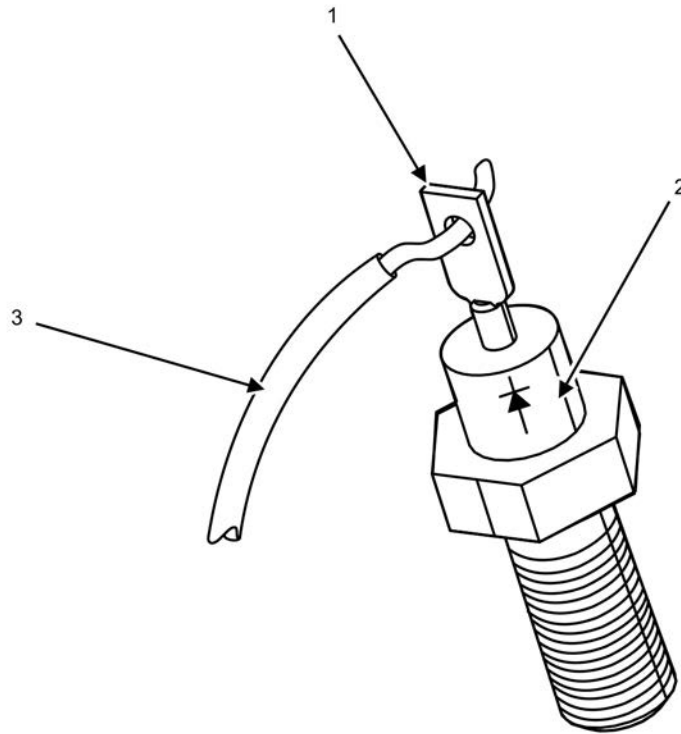
### NOTE

Recorded values should be used to compare resistance measured in step 9 and 10 to those measured in step 11 and 12. Lower resistance value should be  $370\Omega \pm 10\%$ . High resistance value should be  $3.7\text{ M}\Omega \pm 10\%$ . High resistance value will typically be infinite resistance.

14. Compare resistance values obtained in steps 10 and 12 to specifications to determine if rectifier (Figure 17) is serviceable.
15. Proceed to Replace Rectifier Diodes task if one or more diodes (Figure 17, Item 14) require replacement.

### END OF TASK

#### Replace Rectifier Diodes



**Figure 18. 400 Hz Rectifier Diode Removal/Installation — Detail.**

1. Cut soldered wire connection(s) at diode terminal(s) (Figure 18, Item 1) as close as possible to soldered connection to minimize wire length loss.

### CAUTION

Two different diodes (Figure 18, Item 2) with opposite polarity are used on rectifier (Figure 17). Replacement diodes (Figure 18, Item 2) must be installed with same polarity as those removed. Diodes (Figure 18, Item 2) should be removed and replaced one at a time. Failure to comply will cause damage to equipment.

2. Loosen diode mounting nut (Figure 17, Item 12) until it can be rotated freely if diode symbol is not visible.

3. Observe and note orientation and polarity of each diode (Figure 17, Item 14) as it is removed.
4. Remove diode mounting nut (Figure 17, Item 12), lock washer (Figure 17, Item 13) and diode (Figure 17, Item 14) from rectifier connection plate (Figure 17, Item 5).
5. Discard nut (Figure 17, Item 12), lock washer (Figure 17, Item 13), and diode (Figure 17, Item 14).
6. Inspect diode mounting surface of rectifier connection plate (Figure 17, Item 5) where removed diode (Figure 17, Item 14) was attached and clean as required.
7. Perform Test Rectifier task, steps 9 through 15 on replacement diodes (Figure 17, Item 14).

### CAUTION

Material on threads of a fastener will alter torque characteristics. Exercise care to prevent thread contamination when applying electrically conductive grease to contact surfaces. Failure to comply may cause damage to equipment.

8. Apply small amount of electrically conductive grease under hex head of replacement diode (Figure 17, Item 14) in six places.
9. Insert diode (Figure 17, Item 14) with diode symbol visible into rectifier connection plate (Figure 17, Item 5) using orientation and polarity noted in step 3.
10. Position nut (Figure 17, Item 12) and new lock washer (Figure 17, Item 13) onto diode (Figure 17, Item 14).
11. Tighten nut (Figure 17, Item 12) to torque value of 27 – 30 in/lb (3 – 3.4 Nm).
12. Remove approximately three-quarters of an inch of insulation from wire (Figure 18, Item 3) that was cut and removed from diode (Figure 18, Item 2) in step 1.

### CAUTION

Heat created by soldering process can damage diodes. Application of diode protection is required to prevent damage from occurring. Failure to comply may cause damage to equipment.

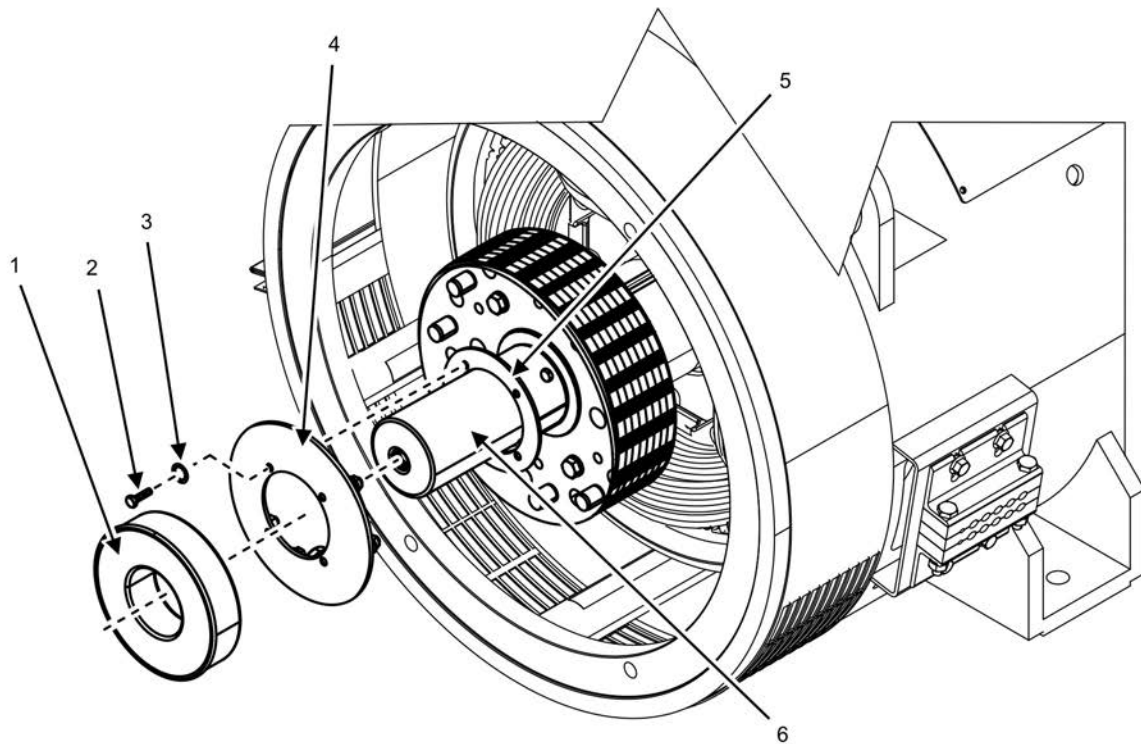
13. Attach heat sink to diode terminal (Figure 18, Item 1) to be soldered, midpoint between body of diode (Figure 18, Item 2) and diode terminal (Figure 18, Item 1).
14. Use soldering tool and solder to make sound electrical connection of wire (Figure 18, Item 3) to diode terminal (Figure 18, Item 1).
15. Remove heat sink after solder connection has cooled.
16. Trim excess wire (Figure 18, Item 3) that extends greater than 1/8 in beyond exit side of diode terminal (Figure 18, Item 1).
17. Repeat steps 1 through 16 for remaining diodes.

### END OF TASK

#### Replace Rectifier

1. Perform Replace Bearing task, steps 1 through 3.
2. Ensure Test Rectifier task, steps 1 through 7, have been performed.
3. Remove four bolts (Figure 19, Item 2) and four lock washers (Figure 19, Item 3) that attach rectifier (Figure 19, Item 4) to rectifier mounting hub (Figure 19, Item 5).
4. Remove rectifier (Figure 19, Item 4) from generator rotor shaft (Figure 19, Item 6) and place on suitable work surface.
5. Perform Test Rectifier task, steps 1 through 15, on new rectifier (Figure 19, Item 4).





**Figure 19. 400 Hz Generator Bearing and Rectifier — Removal/Installation.**

6. Align holes in rectifier (Figure 19, Item 4) with matching holes in rectifier mounting hub (Figure 19, Item 5).
7. Position four bolts (Figure 19, Item 2) and four new lock washers (Figure 19, Item 3) to attach rectifier (Figure 19, Item 4) to rectifier mounting hub (Figure 19, Item 5).
8. Tighten four bolts (Figure 19, Item 2) to torque value of 8 ft/lb (10 Nm).

#### **END OF TASK**

#### **Inspect Bearing**

1. Examine bearing (Figure 19, Item 1) for discoloration and corrosion that are signs of heat and contamination damage.
2. Touch outer race of bearing (Figure 19, Item 1) lightly with fingertips and rotate slowly in a back-and-forth motion to feel and listen for any signs of roughness and/or friction.
3. Proceed to Replace Bearing task if any signs of damage appear or if bearing (Figure 19, Item 1) does not rotate freely.

#### **END OF TASK**

#### **Replace Bearing**

1. Attach bearing puller to bearing (Figure 19, Item 1).

## CAUTION

When a bearing (Figure 19, Item 1) is removed for any reason, always install a new bearing (Figure 19, Item 1). Failure to comply may cause damage to equipment.

2. Remove bearing (Figure 19, Item 1) from generator rotor shaft (Figure 19, Item 6).
3. Clean bearing surface of generator rotor shaft (Figure 19, Item 6).
4. Press new bearing (Figure 19, Item 1) onto generator rotor shaft (Figure 19, Item 6).

## END OF TASK

### Test Exciter Rotor Winding

1. Identify each of three exciter rotor wires (Figure 17, Item 4) disconnected from rectifier connection plates (Figure 17, Item 5).
2. Select Ohms resistance function on multimeter (Figure 15, Item 4).
3. Touch either meter probe (Figure 15, Item 3 or 5) to first of three exciter rotor wires (Figure 17, Item 4).
4. Touch second meter probe (Figure 15, Item 3 or 5) to second of three exciter rotor wires (Figure 17, Item 4).
5. Observe and record value of resistance.
6. Touch either meter probe (Figure 15, Item 3 or 5) to second of three exciter rotor wires (Figure 17, Item 4).
7. Touch second meter probe (Figure 15, Item 3 or 5) to third of three exciter rotor wires (Figure 17, Item 4).
8. Observe and record value of resistance.
9. Touch either meter probe (Figure 15, Item 3 or 5) to third of three exciter rotor wires (Figure 17, Item 4).
10. Touch second meter probe (Figure 15, Item 3 or 5) to first of three exciter rotor wires (Figure 17, Item 4).
11. Observe and record value of resistance.
12. Touch either meter probe (Figure 15, Item 3 or 5) to bare metal area (ground) of exciter rotor (Figure 20, Item 3).
13. Observe and note resistance value of each of three exciter rotor wires (Figure 15, Item 4) obtained in step 14.
14. Touch second meter probe (Figure 15, Item 3 or 5) individually to each of three exciter rotor wires (Figure 15, Item 4).

## NOTE

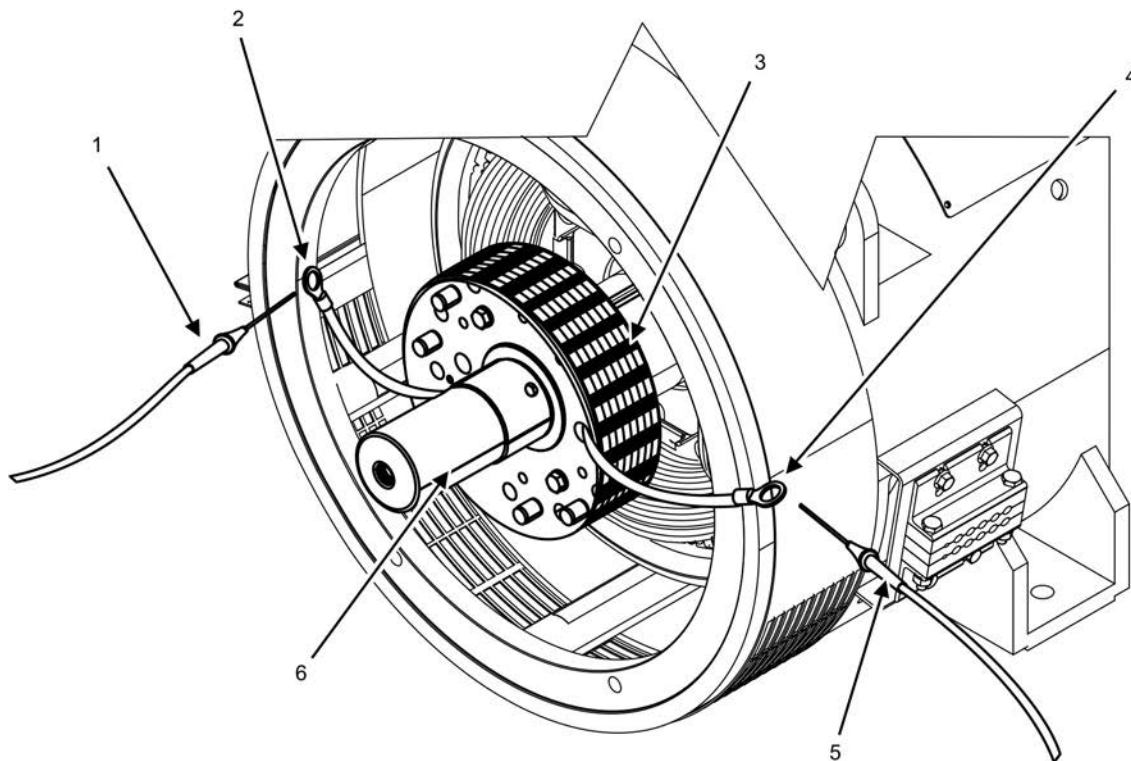
Resistance values obtained in steps 3 through 10 should be  $0.115 \Omega \pm 10\%$ . Accuracy of a multimeter (Figure 15, Item 4) is unreliable when measuring values lower than 1 measurement value greater than  $1\Omega$  or with a  $\pm 10\%$  variance for any pair of wires indicates a defective exciter rotor (Figure 20, Item 3).

Resistance value obtained in step 14 of exciter rotor winding (Figure 20, Item 3) to ground should be at least  $1 M\Omega$ .

15. Compare resistance values obtained in steps 5, 8, 11, and 14 to specifications to determine if exciter rotor (Figure 20, Item 3) is serviceable.

## END OF TASK

## Test Generator Rotor Winding



**Figure 20. Test 400 Hz Generator Rotor Winding.**

### NOTE

Exciter rotor (Figure 20, Item 3) is as it would appear with generator rotor wires (Figure 20, Items 2 and 4) passing through exciter rotor (Figure 20, Item 3), with bearing (Figure 19, Item 1), rectifier (Figure 19, Item 4), and rectifier mounting hub (Figure 19, Item 5) removed for clarity.

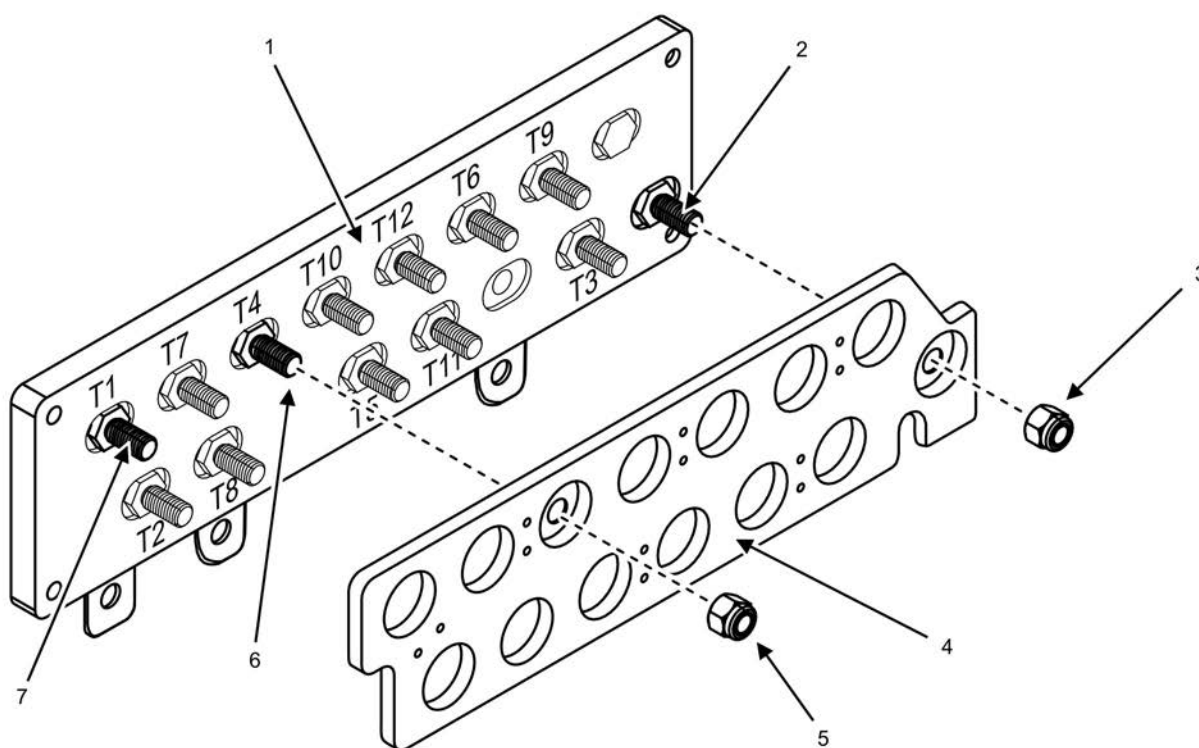
1. Select Ohms resistance function on multimeter (Figure 15, Item 4).
2. Touch either meter probe (Figure 15, Item 3 or 5) to generator rotor wire (Figure 20, Item 2 or 4) identified as F1+ in Test Rectifier task, step 3.
3. Touch second meter probe (Figure 15, Item 3 or 5) to generator rotor wire (Figure 20, Item 2 or 4) identified as F2- in Test Rectifier task, step 5.
4. Observe and record resistance value.
5. Touch either meter probe (Figure 15, Item 3 or 5) to either generator rotor wire (Figure 20, Item 2 or 4).
6. Touch second meter probe (Figure 15, Item 3 or 5) to bare metal area (ground) of generator rotor (Figure 20, Item 6).
7. Observe and record insulation resistance.

**NOTE**

Resistance value of generator rotor winding obtained in step 3 should be  $2.31\Omega \pm 10\%$ .

Insulation resistance value of generator rotor winding to ground obtained in step 6 should be at least 1 M $\Omega$ .

8. Compare resistance values obtained in step 3 and step 6 to specifications to determine if generator rotor winding is serviceable.

**END OF TASK****Test Generator Stator Winding**

**Figure 21. Test 400 Hz Generator Stator Winding.**

**NOTE**

Generator stator output wire connections and T1 through T12 markings are not visible from the front of voltage selection board (Figure 21, Item 1). T1 through T12 markings are shown for identifying generator stator output wire connections from the front. The order of stator output wire connections is: T1 – T4, T2 – T5, T3 – T6, T7 – T10, T8 – T10, and T9 – T10.

1. Note voltage selected on voltage selection moveable board (Figure 21, Item 4) to aid with installation.
2. Remove 12 lock nuts (Figure 21, Item 5) that make electrical connection of voltage selection board (Figure 21, Item 1).
3. Remove one lock nut (Figure 21, Item 3) that makes mechanical connection of voltage selection board (Figure 21, Item 1).

4. Discard lock nuts (Figure 21, Items 3 and 5).
5. Remove voltage selection moveable board (Figure 21, Item 4) and set aside for installation.
6. Select Ohms resistance function on multimeter (Figure 15, Item 4).
7. Touch either meter probe (Figure 15, Item 3 or 5) to reconnection stud marked T1 (Figure 21, Item 7).
8. Touch second meter probe (Figure 15, Item 3 or 5) to reconnection stud marked T4 (Figure 21, Item 6).
9. Observe and record value of resistance.
10. Repeat steps 7 through 9 for remaining reconnection studs.
11. Touch either meter probe (Figure 15, Item 3 or 5) to reconnection stud marked T1 (Figure 21, Item 7).
12. Touch second meter probe (Figure 15, Item 3 or 5) to bare metal area (ground) of generator stator (Figure 14, Item 3).
13. Observe and record value of resistance.
14. Repeat steps 11 through 13 for reconnection studs marked T2, T3, T7, T8, and T9.

### NOTE

Resistance values obtained in steps 7 through 9 should be  $0.043 \Omega \pm 10\%$ . Accuracy of a multimeter (Figure 15, Item 4) is unreliable when measuring values lower than  $1\Omega$ . Measurement value of infinity or more than  $1\Omega$  for any pair of wires indicates a defective generator stator (Figure 14, Item 3).

Resistance values obtained in steps 11 through 14 of each reconnection stud to ground should be at least  $1 M\Omega$ .

15. Compare resistance values obtained in steps 7 through 9 and steps 11 through 14 to specifications to determine if generator stator (Figure 14, Item 3) is serviceable.
16. Complete Assemble Voltage Selection Board task if generator stator (Figure 14, Item 3) is serviceable.

### END OF TASK

#### Assemble Voltage Selection Board

1. Place voltage selection moveable board (Figure 21, Item 4) onto voltage selection board (Figure 21, Item 1) at voltage selected position noted in Test AC Generator Stator Winding, step 1.
2. Position 13 new lock nuts (Figure 21, Item 3 and 5) onto reconnection studs (Figure 21, Item 2 and 6).
3. Tighten nuts to torque value of 22-27 in/lb (10-12 Nm).

### END OF TASK

#### Install End Bell

### NOTE

Steps 1 through 9 apply if rectifier (Figure 17) is new. Proceed to step 10 if rectifier (Figure 17) was not removed.

1. Perform Test Rectifier task, steps 1 through 15.
2. Perform Replace Rectifier task, steps 5 through 7.

3. Attach diode wires (Figure 17, Item 8) tagged or marked F2- and F2- generator rotor wire (Figure 17, Item 8) onto terminal stud F2- (Figure 17, Item 6).
4. Install new lock washer (Figure 17, Item 10) and nut (Figure 17, Item 11) onto terminal stud F2- (Figure 17, Item 6).
5. Attach diode wires (Figure 17, Item 8) tagged or marked F1+ and F1+ generator rotor wire (Figure 17, Item 9) to terminal stud F1+ (Figure 17, Item 7).
6. Install new lock washer (Figure 17, Item 10) and nut (Figure 17, Item 10) onto terminal stud F1+ (Figure 17, Item 7).
7. Attach each marked or tagged exciter rotor wire (Figure 17, Item 4) onto corresponding marked or tagged rectifier connection plate (Figure 17, Item 5) using bolt (Figure 17, Item 1) and new lock washer (Figure 17, Item 2).
8. Tighten three bolts (Figure 17, Item 1) to torque value of 8 ft/lb (10 Nm).
9. Press new bearing (Figure 19, Item 1) onto generator rotor shaft (Figure 19, Item 6) if bearing (Figure 19, Item 1) was removed.
10. Remove tags or marks that will interfere with generator operation.
11. Insert P90 wiring plug (Figure 13, Item 6) and P90 wiring plug wires (Figure 13, Item 7) into generator stator wire port (not shown) from inside generator stator (Figure 14, Item 3) behind wire separator (Figure 13).

### WARNING

Component being lifted weighs approximately 65 lb (30 kg). Two personnel or a suitable lifting device is necessary to lift component. Failure to comply may cause injury or death to personnel.

### CAUTION

Use extreme caution when installing end bell (Figure 14, Item 1) onto generator bearing (Figure 14, Item 4). End bell (Figure 14, Item 1) is heavy and must be installed without any exciter stator (Figure 14, Item 2) contact with bearing (Figure 14, Item 4). Failure to comply will cause damage to equipment.

### NOTE

Assistance is required to perform steps 1 through 4.

12. Align tag or mark on end bell (Figure 14, Item 1) with corresponding tag or mark on generator stator (Figure 14, Item 3).

### NOTE

End bell (Figure 14, Item 1) may resist installation onto bearing (Figure 14, Item 4). Tap various points around outside of bearing mating surface using a tool that will not damage end bell (Figure 14, Item 1) until end bell (Figure 14, Item 1) machined surface contacts generator stator (Figure 14, Item 3) machined surface.

13. Push end bell (Figure 14, Item 1) bearing mating surface onto bearing (Figure 14, Item 4) until threads in mounting holes can be engaged by bolts (Figure 14, Item 7).
14. Position four bolts (Figure 14, Item 7), four new lock washers (Figure 14, Item 6), and four flat washers (Figure 14, Item 5) into each mounting hole until threads are engaged.

15. Tighten each bolt (Figure 14, Item 7) gradually in crisscross sequence using the same number of turns each time for each bolt (Figure 14, Item 7) to draw end bell (Figure 14, Item 1) onto generator stator (Figure 14, Item 3).
16. Verify end bell (Figure 14, Item 1) machined surface has fully engaged generator stator (Figure 14, Item 3).
17. See Remove End Bell task, steps 3 through 9 if end bell (Figure 14, Item 1) machined surface does not fully engage generator stator (Figure 14, Item 3).
18. Examine bearing (Figure 14, Item 4) and end bell (Figure 14, Item 1) for indication of obstruction. Repair or replace as required.
19. Repeat steps 2 through 7 as required.
20. Tighten four bolts (Figure 14, Item 7) to torque value of 45 ft/lb (61 Nm).
21. Pull excess P90 wiring plug wire (Figure 13, Item 7) from generator stator wire port (not shown) located behind wire separator Figure 13 to length tagged or marked in Remove End Bell task, step 3.
22. Insert P90 wiring plug wires (Figure 13, Item 7) into wire separator insulators (Figure 13, Items 10, 11, and 12) according to location noted in Remove End Bell task, step 8.
23. Position bolt (Figure 13, Item 2) into left-hand side of wire separator to align holes in upper wire separator bracket (Figure 13, Item 3) and wire separator insulators (Figure 13, Item 10, 11, and 12).
24. Align upper wire separator bracket (Figure 13, Item 3) with matching holes in generator stator (Figure 13, Item 1).
25. Position two bolts (Figure 13, Item 5) and two new lock washers (Figure 13, Item 4) to attach upper wire separator bracket (Figure 13, Item 3) to generator stator (Figure 13, Item 1).
26. Tighten two bolts (Figure 13, Item 5) to torque value of 7.80 ft/lb (10.4 Nm).
27. Remove nut (Figure 13, Item 8) and lock washer (Figure 13, Item 9) from bolt (Figure 13, Item 2) at right-hand side of wire separator Figure 13. Discard lock washer (Figure 13, Item 9).
28. Place new lock washer (Figure 13, Item 9) and nut (Figure 13, Item 8) onto bolt (Figure 13, Item 2) at right-hand side of wire separator (Figure 13).
29. Place new lock washer (Figure 13, Item 9) and nut (Figure 13, Item 8) onto bolt (Figure 13, Item 2) at left-hand side of wire separator (Figure 13).
30. Tighten two bolts (Figure 13, Item 2) to torque value of 8 ft/lb (10 Nm).
31. Feed P90 wiring plug (Figure 13, Item 6) and P90 wiring plug wires (Figure 13, Item 7) through clamp (not shown) located adjacent to wire separator Figure 13.
32. Connect P90 wiring plug (Figure 13, Item 6) to connector (not shown) located adjacent to wire separator Figure 13.
33. Install fuel tank with fuel manifold attached (WP 0052, Remove/Install Fuel Tank).
34. Install interior panels (WP 0034, Remove/Install Interior Body Panels).
35. Connect coalescer return hose to underside of radiator support panel (WP 0034, Remove/Install Interior Body Panels).
36. Install right-side body panel (WP 0033, Remove/Install Right-Side Body Panels).
37. Connect coalescer return hose to top side of radiator support panel (WP 0034, Remove/Install Interior Body Panels).
38. Install coalescer cover (WP 0070, Remove/Install Coalescer).
39. Install ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
40. Close generator set doors.
41. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).

42. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
43. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL CONTACTOR**

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**INITIAL SETUP:****Test Equipment**

Load Bank (WP 0179, Table 2, Item 2)

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Contactor, electrical (1) (WP 0121, Repair Parts List, Figure 16, Item 4)

Nut, lock M6 brass (3) (WP 0121, Figure 16, Item 8)

Grease, electrically conductive (WP 0180, Expendable and Durable Items List, Item 22)

**Personnel Required**

91D (1)

Assistant (1)

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**References**

WP 0059, Remove/Install Output Terminal Board

WP 0100, General Maintenance

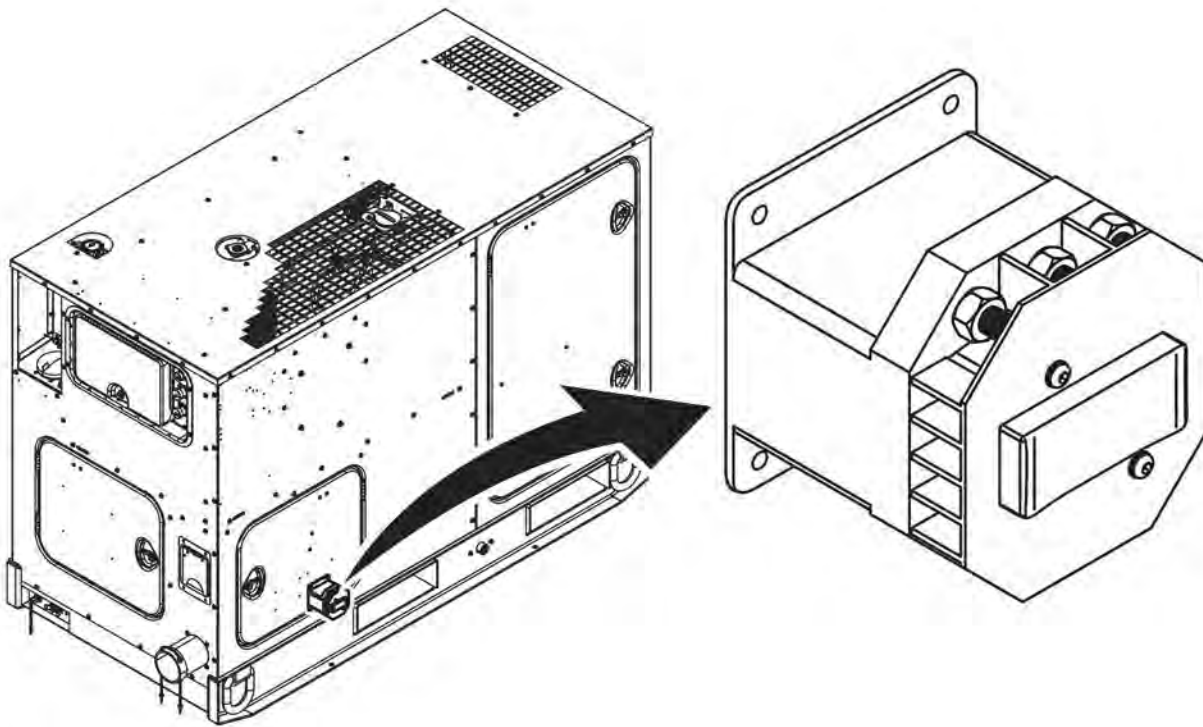
**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

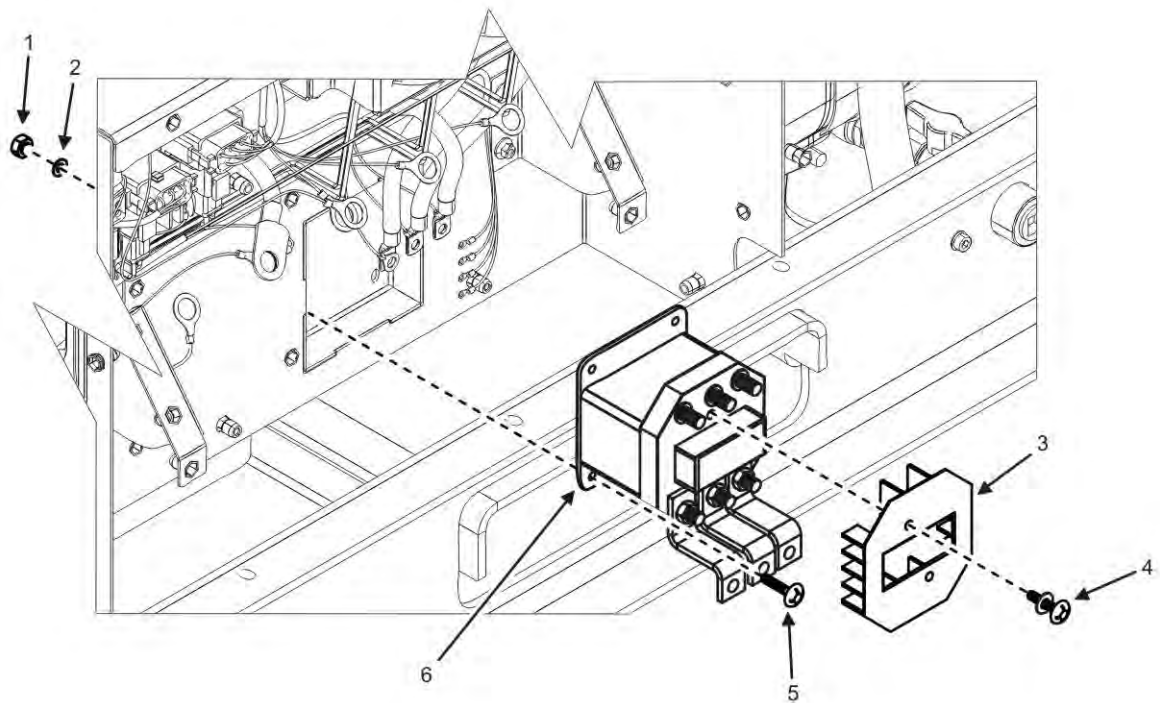
Battery ground cable removed (WP 0037, Remove/Install Batteries)

Right-side panel removed (WP 0033, Remove/Install Right-Side Body Panel)

**REMOVE/INSTALL CONTACTOR****Remove Contactor**

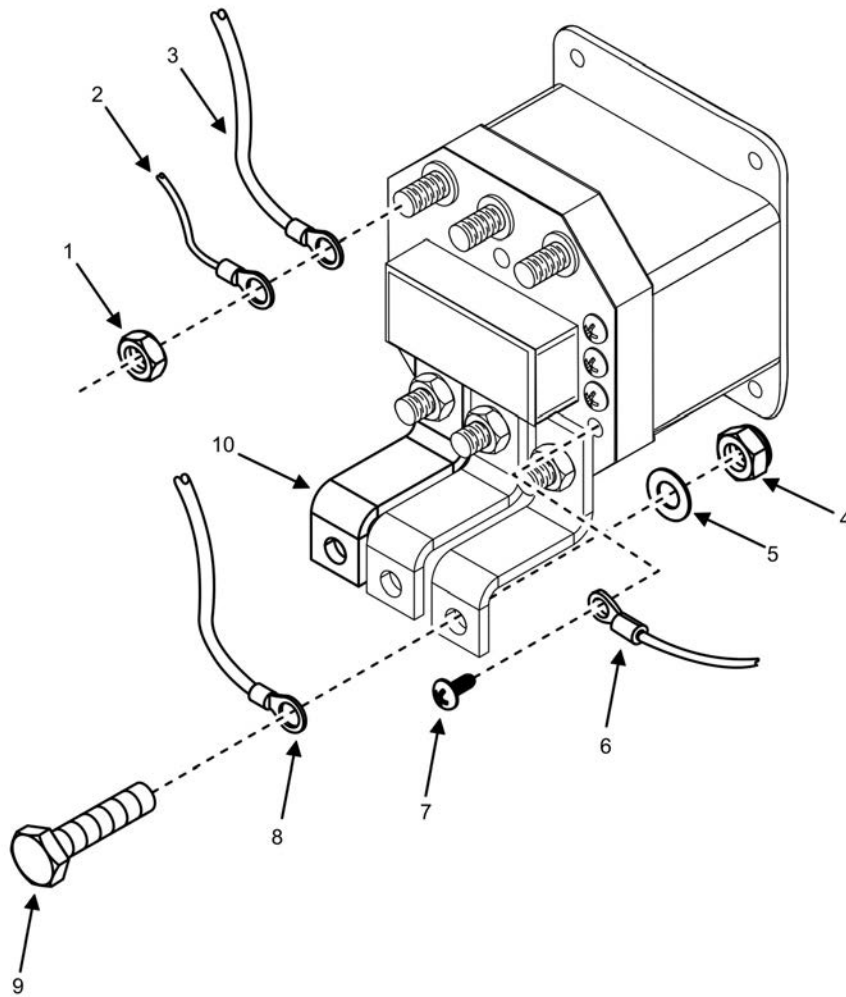
**Figure 1. Contactor — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate contactor (Figure 1).
3. Remove cable entry guard and output terminal board (WP 0059, Remove/Install Output Terminal Board).



**Figure 2. Contactor — Details.**

4. Remove two screws and captive flat washers (Figure 2, Item 4) securing contactor cover (Figure 2, Item 3).
5. Remove contactor cover (Figure 2, Item 3).



**Figure 3. Contactor Wire — Removal.**

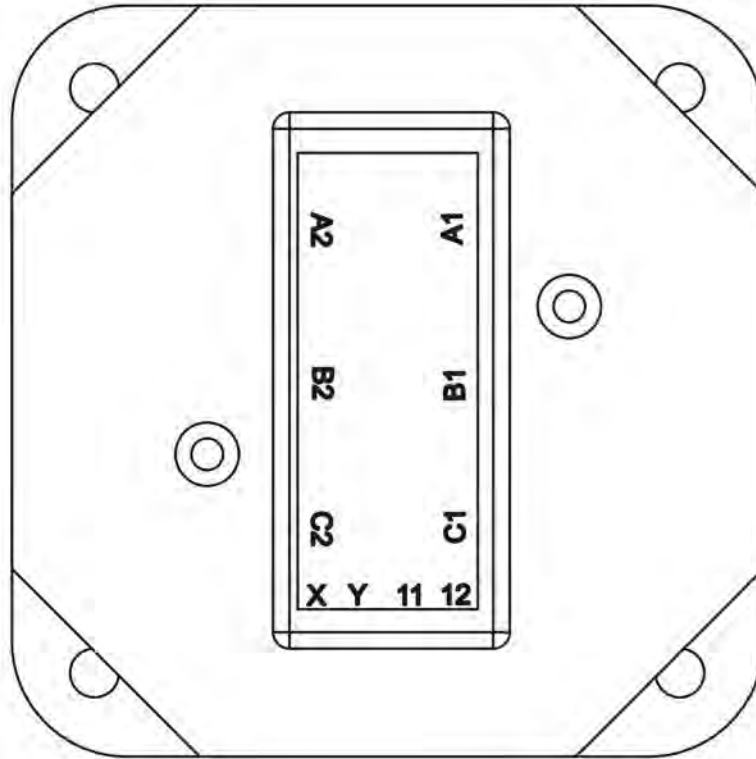
### NOTE

Prior to disassembly, tag all electrical wires and cables for identification. Tags will be used as a guide during reassembly.

Contactor is labeled (Figure 4). Label each wire according to the location label on the contactor to aid in installation.

6. Tag electrical wires (Figure 3, Items 3 and 8) and wiring harness wires (Figure 3, Items 2 and 6) on contactor (Figure 2, Item 6) according to location labels on contactor (Figure 4).
7. Remove three hex nuts (Figure 3, Item 1) securing electrical wires (Figure 3, Items 2 and 3) to top studs on contactor (Figure 2, Item 6).
8. Remove electrical wires (Figure 3, Items 2 and 3) from contactor (Figure 2, Item 6).
9. Remove three screws (Figure 3, Item 9), flat washers (Figure 3, Item 5), and lock nuts (Figure 3, Item 4) securing electrical wires (Figure 3, Item 8) to busbars (Figure 3, Item 10) on bottom studs of contactor (Figure 2, Item 6).
10. Remove electrical wires (Figure 3, Item 8) from contactor (Figure 2, Item 6).

11. Discard lock nuts (Figure 3, Item 4).
12. Tag four wiring harness electrical wires (Figure 3, Item 6) on contactor (Figure 2, Item 6).
13. Remove four screws (Figure 3, Item 7) securing wiring harness electrical wires (Figure 3, Item 6) to contactor (Figure 2, Item 6)
14. Inspect electrical wires (Figure 3, Items 3 and 8) and wiring harness electrical wires (Figure 3, Items 2 and 6) for damage and repair wires or harnesses as required (WP 0100, General Maintenance). Replace wires (Figure 3, Items 3 and 8) and wiring harness electrical wires (Figure 3, Items 2 and 6) as necessary.



**Figure 4. Contactor Wire Labels.**

15. Remove four screws (Figure 2, Item 5), four washers (Figure 2, Item 2), and four hex flange nuts (Figure 2, Item 1) that secure contactor (Figure 2, Item 6) to output box.
16. Remove contactor (Figure 2, Item 6) from output box and place on a suitable work surface.

**END OF TASK**

### Inspect Contactor

1. Inspect contactor cover (Figure 2, Item 3) for cracks and damage and replace contactor (Figure 2, Item 6) as required.
2. Inspect two contactor cover screws (Figure 2, Item 4) for worn threads and damaged captive flat washer (Figure 2, Item 4) and other signs of obvious damage and replace contactor (Figure 2, Item 6) as required.
3. Inspect contactor (Figure 2, Item 6) for signs of obvious damage and replace as required.
4. Inspect busbars (Figure 3, Item 10) for cracks, corrosion, and other signs of obvious damage. Replace as required.
5. Inspect all mounting hardware and replace as required.

### END OF TASK

### Test Contactor

1. Remove contactor (Figure 5, Item 2). See Remove Contactor task.
2. Remove two screws and captive washers (Figure 5, Item 3) securing contactor cover (Figure 5, Item 1) to contactor (Figure 5, Item 2) if not already removed.
3. Remove contactor cover (Figure 5, Item 1) if not already removed.

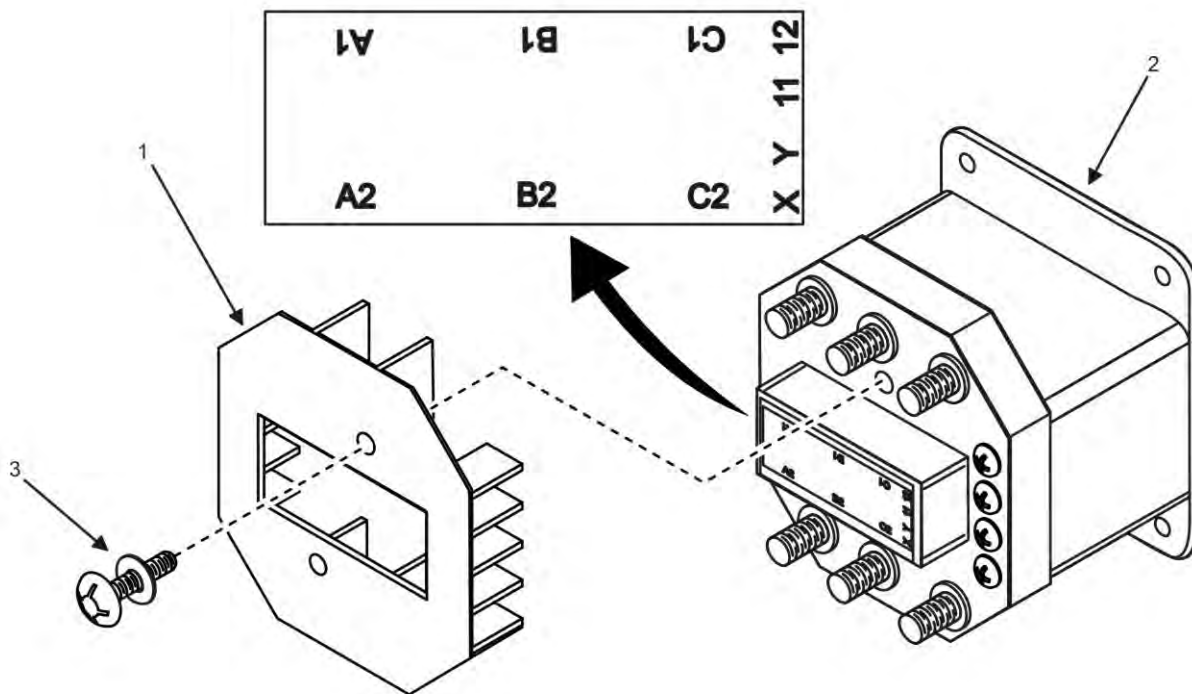


Figure 5. Contactor — Terminals.

**NOTE**

Terminals A1 through C1 (Figure 5) are for the wiring from the voltage selection board and A2 through C2 (Figure 5) are for the output box terminal wires. Terminals X and Y (Figure 5) are for the wires that energize the contactor coil. Terminals 11 and 12 (Figure 5) are for wires for the auxiliary contact.

4. Measure the resistance between each terminal of the input side of contactor (Figure 5, Item 2) (Terminals A1 through C1) and output side of contactor (Figure 5, Item 2) (Terminals A2 through C2). Ensure resistance between any two terminals is infinite or high (approximately 100,000 Ohms ( $\Omega$ ) or more).
5. Replace contactor (Figure 5, Item 2) if a low (10  $\Omega$  or less) or zero  $\Omega$  value is obtained. See Install Contactor task.

**NOTE**

Resistance reading between terminals X and Y should be  $47 \Omega \pm 10\%$ .

6. Measure the resistance between terminals X and Y (Figure 5) using a multimeter set to test resistance.
7. Replace contactor (Figure 5, Item 2) if reading is outside of specification. See Install Contactor task.
8. Measure for continuity between terminals 11 and 12 (Figure 5) and between each terminal and ground using a multimeter set to test continuity.
9. Replace contactor (Figure 5, Item 5) if continuity is found. See Install Contactor task.

**NOTE**

Any continuity measurement between wires A1, B1, and C1 with wires installed to contactor terminals A1 through C1 will result in continuity through the voltage selection board. Ensure wires are removed when checking for continuity between terminals A1, B1, and C1 to obtain proper measurement.

10. Measure resistance between each contactor terminal (11, 12, A1, A2, B1, B2, C1, and C2) (Figure 5) using a multimeter set to test resistance. Ensure resistance between any two terminals is infinite or high.
11. Replace contactor (Figure 5, Item 2) if a low or zero  $\Omega$  value is obtained. See Install Contactor task.
12. Measure resistance between terminal X and each terminal (11, 12, A1, A2, B1, B2, C1, and C2) (Figure 5) using a multimeter set to test resistance. Ensure resistance between X and any other terminal is infinite or high.
13. Replace contactor (Figure 5, Item 2) if resistance is low or zero  $\Omega$ . See Install Contactor task.
14. Measure resistance between terminal Y and each terminal (11, 12, A1, A2, B1, B2, C1, and C2) (Figure 5) using a multimeter set to test resistance. Ensure resistance between Y and any other terminal is infinite or high.
15. Replace contactor (Figure 5, Item 2) if resistance is low or zero  $\Omega$ . See Install Contactor task.

**END OF TASK**

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**Install Contactor**

1. Position contactor (Figure 2, Item 6) to mounting location in output box and align the mounting holes.
2. Secure contactor (Figure 2, Item 6) to mounting location in output box by installing four screws (Figure 2, Item 5), four washers (Figure 2, Item 2), and four hex flange nuts (Figure 2, Item 1). Tighten hex flange nuts (Figure 2, Item 1) to 25 – 31 in/lb (3 – 4 Nm).

**NOTE**

Identification tags should remain in place until the output box is completely reassembled and has been tested for proper operation.

Apply a thin coat of electrically conductive grease to all electrical connections prior to assembly.

When more than one electrical wire is connected to a contactor stud, the electrical wire with the heaviest terminal lug shall be installed closest to the contactor (Figure 2, Item 6) with the following electrical wires' terminal lugs progressively decreasing in size.

3. Install three appropriately-tagged electrical wires (Figure 3, Item 3) and wiring harness electrical wires (Figure 3, Item 2) to top studs of contactor (Figure 2, Item 6) using tags and identification labels on contactor (Figure 4).
4. Secure three electrical wires (Figure 3, Item 3) and wiring harness electrical wires (Figure 3, Item 2) with three hex nuts (Figure 3, Item 1). Tighten to 71 – 89 in/lb (8 – 10 Nm).
5. Position three appropriately-tagged electrical wires (Figure 3, Item 8) to matching location on contactor (Figure 2, Item 6).
6. Install each electrical wire (Figure 3, Item 8) to busbar (Figure 3, Item 10) with screw (Figure 3, Item 9), flat washer (Figure 3, Item 5), and new lock nut (Figure 3, Item 4).
7. Tighten screws (Figure 3, Item 9) to 22 – 25 in/lb (3 Nm).
8. Position wiring harness electrical wires (Figure 3, Item 6) to contactor (Figure 2, Item 6) using tags from removal.
9. Install wiring harness electrical wires (Figure 3, Item 6) to contactor (Figure 2, Item 6) with four screws (Figure 3, Item 7)
10. Position contactor cover (Figure 2, Item 3) over contactor (Figure 2, Item 6).
11. Secure contactor cover (Figure 2, Item 3) with two screws with captive flat washers (Figure 2, Item 4).
12. Install cable entry guard and output terminal board (WP 0059, Remove/Install Output Terminal Board).
13. Install right-side body panel (WP 0033, Remove/Install Right-Side Body Panel).
14. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
15. Close generator set doors.
16. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
17. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
18. Repair as required.

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL OUTPUT TERMINAL BOARD**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0179, Table 2, Item 39)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Connection board (1) (WP 0122, Repair Parts List, Figure 17, Item 10)

Nut, lock (4) (WP 0122, Figure 17, Item 12)

Nut, lock (5) (WP 0122, Figure 17, Item 15)

Terminal, stud (5) (WP 0122, Figure 17, Item 18)

Brush, wire, scratch, brass (WP 0180, Expendable and Durable Items List, Item 7)

Grease, electrically conductive (WP 0180, Item 22)

Tag, marker (WP 0180, Item 37)

**Personnel Required**

91D (1)

Assistant (1)

**References**

WP 0100, General Maintenance

**Equipment Conditions**

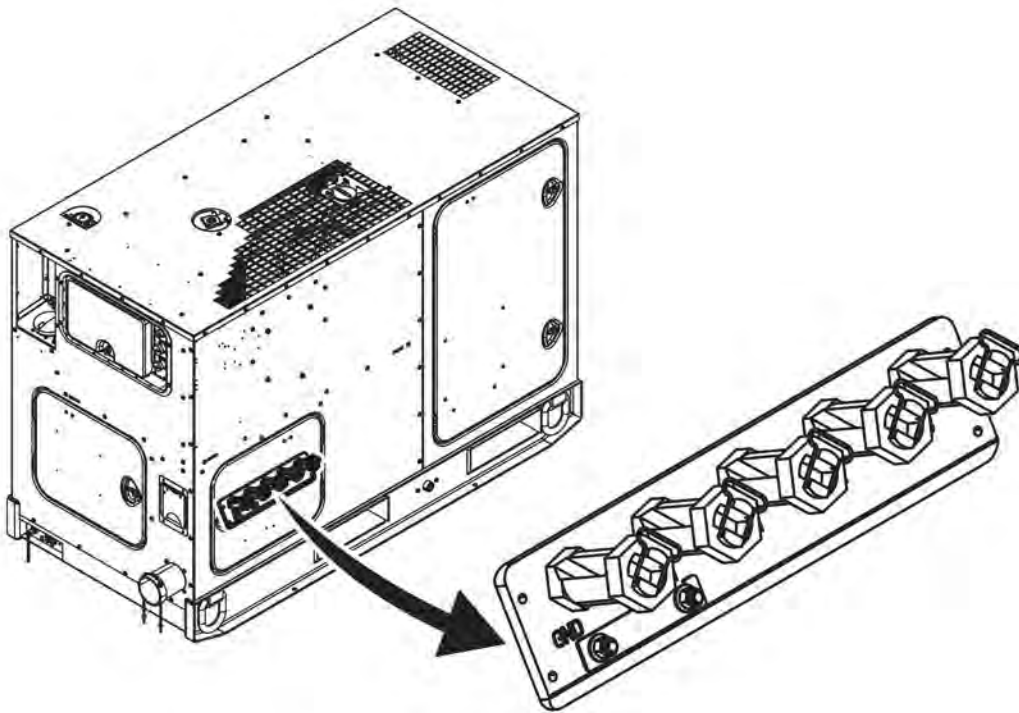
Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

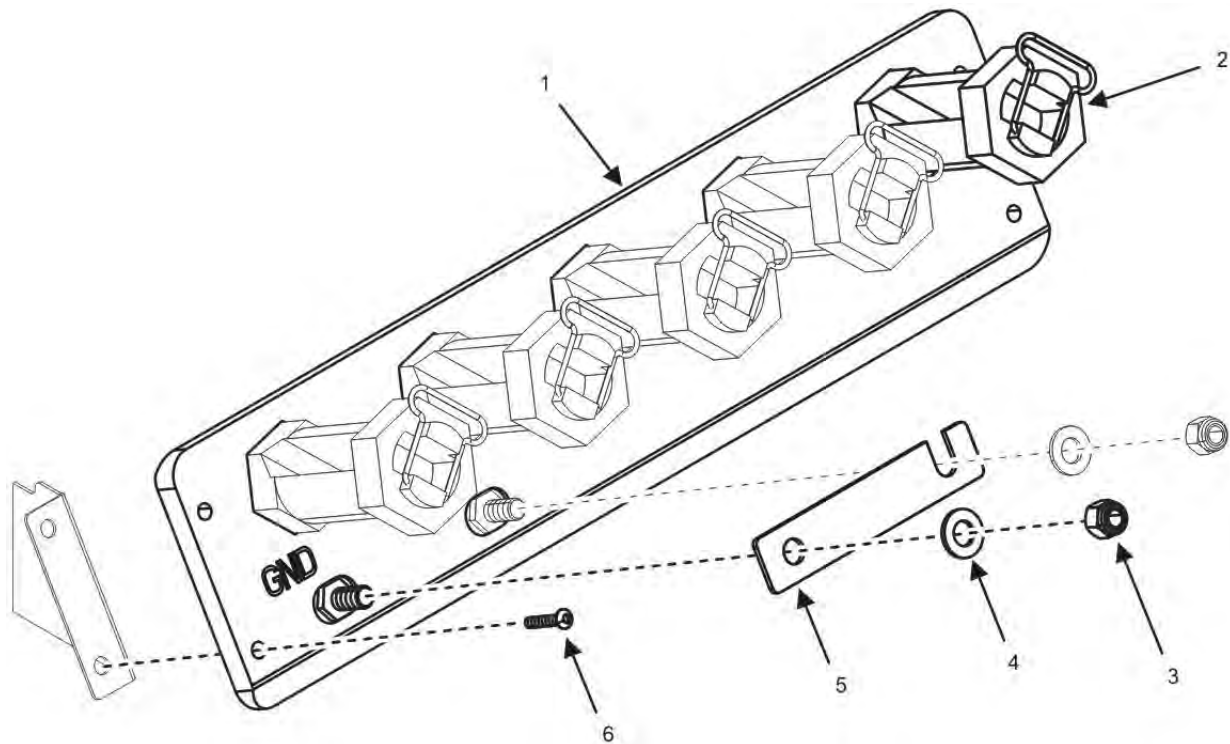
Right-side panel removed (WP 0033, Remove/Install Right-Side Body Panel)

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**REMOVE/INSTALL OUTPUT TERMINAL BOARD****Remove Output Terminal Board**

**Figure 1. Output Terminal Board — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove four screws (not shown) securing upper output box guard (not shown) over output box.
3. Remove upper output box guard (not shown) from output box.
4. Remove six screws (not shown) securing lower output box guard (not shown) and access door (not shown) over output box.
5. Remove lower output box guard (not shown) and access door (not shown) from output box.
6. Locate output terminal board in output box (Figure 1).
7. Remove four screws (Figure 2, Item 6) securing output terminal board (Figure 2, Item 1) to output box.
8. Position output terminal board (Figure 2, Item 1) to access underside of board.



**Figure 2. Output Terminal Board — Detail.**

### NOTE

Five large terminal studs (Figure 2, Item 2) are secured to the output terminal board (Figure 2, Item 1). Some terminal studs (Figure 2, Item 2) may have multiple wires (Figure 3, Item 10). Neutral (N) terminal stud also secures wire (not shown) from convenience receptacle to rear of output terminal board (Figure 2, Item 1). Ground (GND) terminal stud also secures grounding straps (not shown). The procedure for removing wires (Figure 3, Item 10) is the same for all five terminal studs (Figure 3, Item 3).

GND and N terminal stud positions have ground busbars (Figure 3, Item 5) installed to the rear and a neutral busbar (Figure 2, Item 5) installed to the front of the output terminal board (Figure 2, Item 1). To aid installation, tag all wires and connectors prior to removal.

Figure 3 is shown from the rear of the terminal board to aid in visualization.

9. Tag all wires (Figure 3, Item 10) according to their terminal stud (Figure 2, Item 2) (Figure 3, Item 3) location on output terminal board (Figure 2, Item 1).
10. Remove nylon lock nut (Figure 3, Item 8) and flat washer (Figure 3, Item 9) securing terminal stud (Figure 3, Item 3) to output terminal board (Figure 2, Item 1). Discard nylon lock nut (Figure 3, Item 8).
11. Remove wires (Figure 3, Item 10) and flat washers (Figure 3, Item 1) from terminal stud (Figure 3, Item 3).
12. Repeat steps 10 and 11 for all remaining terminal studs (Figure 3, Item 3) and wires (Figure 3, Item 10) on output terminal board (Figure 2, Item 1).
13. Remove nut (Figure 3, Item 2) securing terminal stud (Figure 3, Item 3) to output terminal board (Figure 2, Item 1).
14. Repeat step 13 for all remaining terminal studs (Figure 3, Item 3) on output terminal board (Figure 2, Item 1).

15. Remove terminal studs (Figure 2, Item 2) (Figure 3, Item 3) from output terminal board (Figure 2, Item 1).

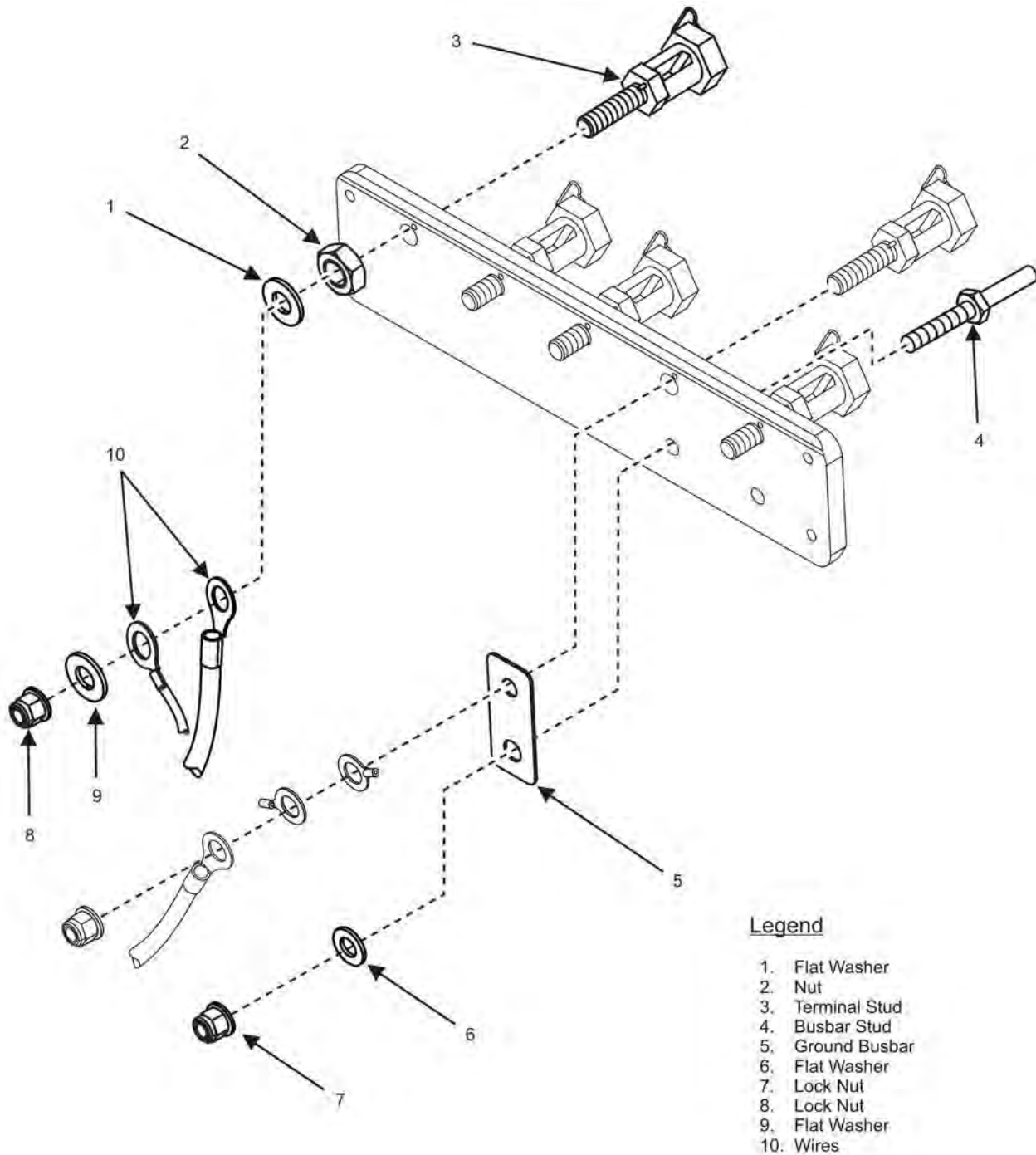


Figure 3. Output Terminal Board Detail — Reverse Side.

16. Remove two GND busbar lock nuts (Figure 3, Item 7) and two flat washers (Figure 3, Item 6) that secure ground busbars (Figure 3, Item 5) on rear of output terminal board (Figure 2, Item 1).
17. Discard lock nuts (Figure 3, Item 7).
18. Remove output terminal board (Figure 2, Item 1) from output box and place on a suitable work surface.
19. Remove lock nuts (Figure 2, Item 3) and flat washers (Figure 2, Item 4) that secure neutral busbar (Figure 2, Item 5) to front of output terminal board (Figure 2, Item 1).
20. Discard lock nuts (Figure 2, Item 3).
21. Remove busbar studs (Figure 3, Item 4) from output terminal board (Figure 2, Item 1).

#### **END OF TASK**

#### **Inspect Output Terminal Board**

1. Inspect output terminal board (Figure 2, Item 1) for cracks or other damage. Replace as required.
2. Inspect all nuts, washers, and screws for obvious signs of damage and replace as required.
3. Inspect terminal studs (Figure 2, Item 2) for damage or corrosion.
4. Inspect wires (Figure 3, Item 10) for fraying, cracks, or corrosion. Repair or replace as required.
5. Remove minor corrosion from wires (Figure 3, Item 10) using wire brush.
6. Inspect ground busbars (Figure 3, Item 5) and neutral busbar (Figure 2, Item 5) for damage and replace as required.

#### **END OF TASK**

#### **Install Output Terminal Board**

1. Install two busbar studs (Figure 3, Item 4) through output terminal board (Figure 2, Item 1).
2. Install neutral busbar (Figure 2, Item 5) to two busbar studs (Figure 3, Item 4) on front of output terminal board (Figure 2, Item 1).
3. Install two flat washers (Figure 2, Item 4) and two new lock nuts (Figure 2, Item 3) to secure neutral busbar (Figure 2, Item 5) to front of output terminal board (Figure 2, Item 1).
4. Install two ground busbars (Figure 3, Item 5) to two busbar studs (Figure 3, Item 4) on rear of output terminal board (Figure 2, Item 1).
5. Install two flat washers (Figure 3, Item 6) and two new lock nuts (Figure 3, Item 7) to secure ground busbars (Figure 3, Item 5) to rear of output terminal board (Figure 2, Item 1).

#### **NOTE**

Five large terminal studs (Figure 2, Item 2) are secured to the output terminal board (Figure 2, Item 1). Some terminal studs (Figure 2, Item 2) may have multiple wires (Figure 3, Item 10). N terminal stud also secures wire (not shown) from convenience receptacle to rear of output terminal board (Figure 2, Item 1). GND terminal stud also secures grounding straps (not shown) to rear of output terminal board (Figure 2, Item 1). The procedure for installing wires (Figure 3, Item 10) is the same for all five terminal studs (Figure 3, Item 3).

GND and N terminal stud positions have ground busbars (Figure 3, Item 5) installed to the rear and a neutral busbar (Figure 2, Item 3) installed to the front of the output terminal board (Figure 2, Item 1).

6. Insert terminal stud (Figure 2, Item 2) through opening in front of output terminal board (Figure 2, Item 1).

7. Install nut (Figure 3, Item 2) to attach output terminal stud (Figure 3, Item 3) to output terminal board (Figure 2, Item 1).
8. Tighten each nut (Figure 3, Item 2) to 27 – 33 ft/lb (36 – 44 Nm).
9. Install flat washer (Figure 3, Item 1) to back of output terminal stud (Figure 3, Item 3).

### NOTE

When more than one wire (Figure 3, Item 10) is connected to a terminal stud (Figure 3, Item 3), the wire (Figure 3, Item 10) with the heaviest terminal lug shall be installed closest to the output terminal board (Figure 2, Item 1) with the following wires (Figure 3, Item 10) terminal lugs progressively decreasing in size.

10. Install appropriately tagged wires (Figure 3, Item 10) over back of output terminal stud (Figure 3, Item 3).
11. Install flat washer (Figure 3, Item 9) over wires (Figure 3, Item 10) and output terminal stud (Figure 3, Item 3).
12. Install new nylon lock nut (Figure 3, Item 8) over wires (Figure 3, Item 10).
13. Tighten nylon lock nut (Figure 3, Item 8) to a torque value of 27 – 33 ft/lb (36 – 44 Nm).
14. Repeat steps 6 – 13 to attach all remaining terminal studs (Figure 2, Item 2) (Figure 3, Item 3) and wires (Figure 3, Item 10) to output terminal board (Figure 2, Item 1).

### NOTE

Two wrenches are required to tighten lock nuts (Figure 3, Item 8).

15. Tighten ground busbar (Figure 3, Item 5) lock nuts (Figure 3, Item 7) to a torque value of 124 – 159 in/lb (14 – 18 Nm).
16. Position output terminal board (Figure 2, Item 1) to output box.
17. Secure output terminal board (Figure 2, Item 1) to output box with four screws (Figure 2, Item 6).
18. Torque screws (Figure 2, Item 6) to 89– 106 in/lb (10 – 12 Nm).
19. Position output box lower guard (not shown) and access door (not shown) over output box.
20. Install six screws (not shown) securing lower output box guard (not shown) and access door (not shown) over output box.
21. Position upper output box guard (not shown) and access door (not shown) over output box.
22. Install upper output box guard (not shown) over output box with four screws (not shown).
23. Tighten screws (not shown) securing upper and lower output box guards (not shown) to 87 – 105 in/lb (10 – 12 Nm).
24. Install right-side body panel (WP 0033, Remove/Install Right-Side Body Panel).
25. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
26. Close generator set doors.
27. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
28. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
29. Repair as required. Remove identification tags.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL VOLTAGE SELECTION BOARD**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0179, Table 2, Item 39)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0179, Table 2, Item 40)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Nut, self-locking (15) (WP 0123, Repair Parts List, Figure 18, Item 12)

Reconnection board (1) (WP 0123, Figure 18, Item 5)

Brush, wire, scratch, brass (WP 0180, Expendable and Durable Items List, Item 7)

Grease, electrically conductive (WP 0180, Item 22)

Tag, marker (WP 0180, Item 37)

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**Personnel Required**

91D (1)

Assistant (1)

**References**

WP 0065, Remove/Install Circuit Breaker

**Equipment Conditions**

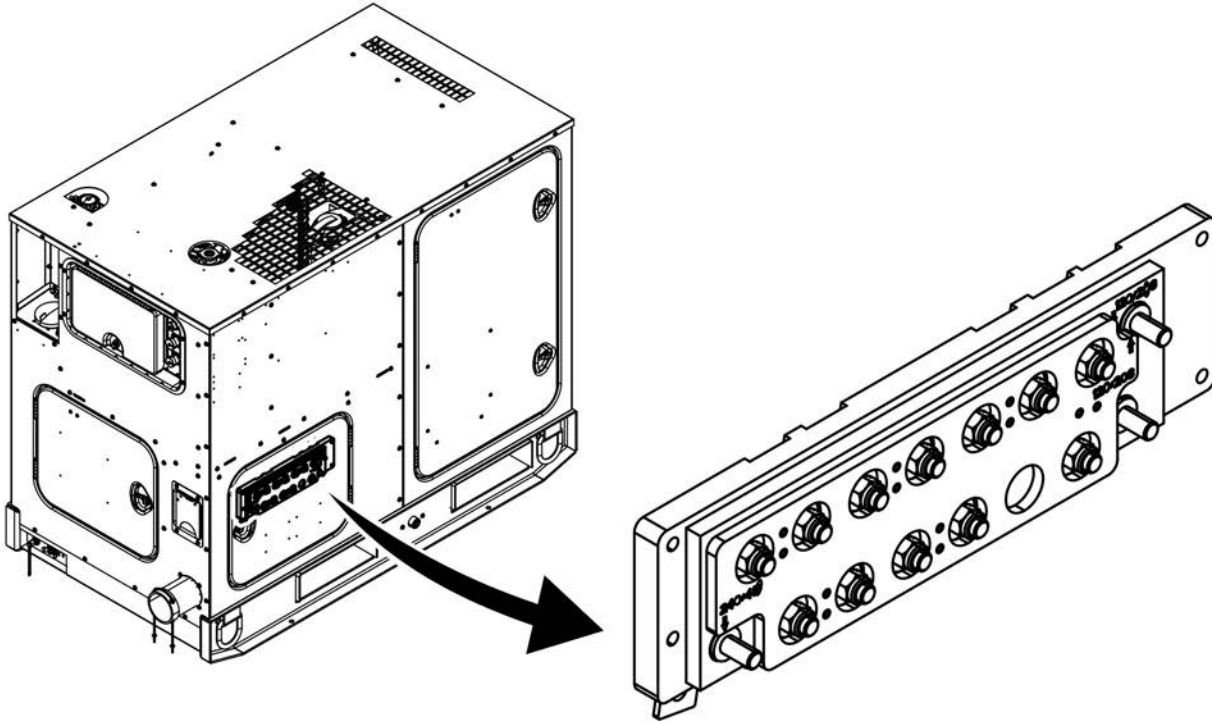
Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Right-side body panel removed (WP 0033, Remove/Install Right-Side Body Panel)

Remove 400 Hz circuit breaker (WP 0065, Remove/Install Circuit Breaker)

**REMOVE/INSTALL VOLTAGE SELECTION BOARD****Remove Voltage Selection Board**

**Figure 1. Voltage Selection Board — Location.**

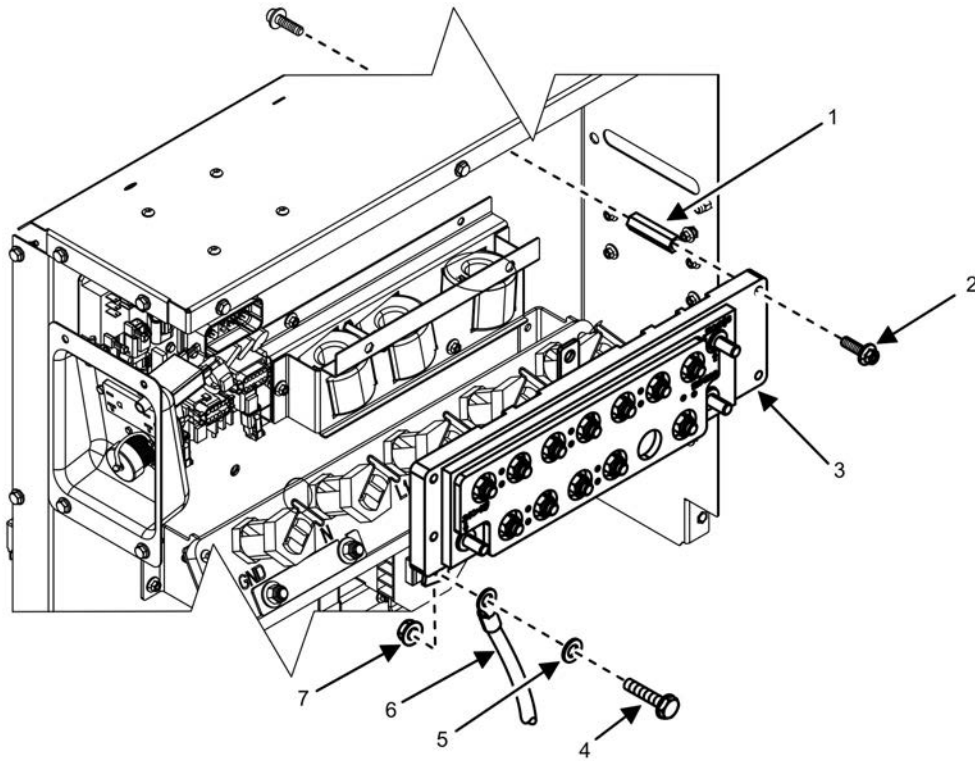
1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove four screws (not shown) securing upper output box guard (not shown) over output box.
3. Remove upper output box guard (not shown) from output box.
4. Locate voltage selection board in output box (Figure 1).

**NOTE**

The following step is only for 400 Hz on UOC 98P generator set. Continue to step 6 if removing the voltage selection board (Figure 2, Item 3) from the 50/60 Hz UOC 98N.

5. Ensure removal of 400 Hz circuit breaker (WP 0065, Remove/Install Circuit Breaker).





**Figure 2. Voltage Selection Board — Removal.**

6. Tag three contactor electrical leads (Figure 2, Item 6) that pass through current transformers to the voltage selection board (Figure 2, Item 3).
7. Remove bolts (Figure 2, Item 4), flat washers (Figure 2, Item 5), and lock nuts (Figure 2, Item 7) that secure contactor electrical leads (Figure 2, Item 6) to voltage selection board (Figure 2, Item 3).
8. Discard lock nuts (Figure 2, Item 7).
9. Remove four screws (Figure 2, Item 2) that secure voltage selection board (Figure 2, Item 3) to spacers (Figure 2, Item 1) mounted inside of output box.
10. Reposition and support voltage selection board (Figure 2, Item 3) to gain access to electrical leads (Figure 3, Item 3) on the reverse side of voltage selection board (Figure 2, Item 3).
11. Tag all electrical leads (Figure 3, Item 3) according to location on voltage selection board (Figure 2, Item 3) IAW Figure 4.

### NOTE

Seven of the bolts (Figure 3, Item 1) removed in step 12 also secure four busbars (Figure 3, Item 4). Tag or mark busbar (Figure 3, Item 4) locations to aid in installation.

12. Remove 13 bolts (Figure 3, Item 1), flat washers (Figure 3, Item 2), and 12 lock nuts (Figure 3, Item 5) securing electrical leads (Figure 3, Item 3) and four busbars (Figure 3, Item 4) to voltage selection board (Figure 2, Item 3). Discard 12 lock nuts (Figure 3, Item 5).
13. Remove electrical leads (Figure 3, Item 3) and busbars (Figure 3, Item 4).
14. Remove voltage selection board (Figure 2, Item 3) from output box and place on a suitable work surface.

**END OF TASK**

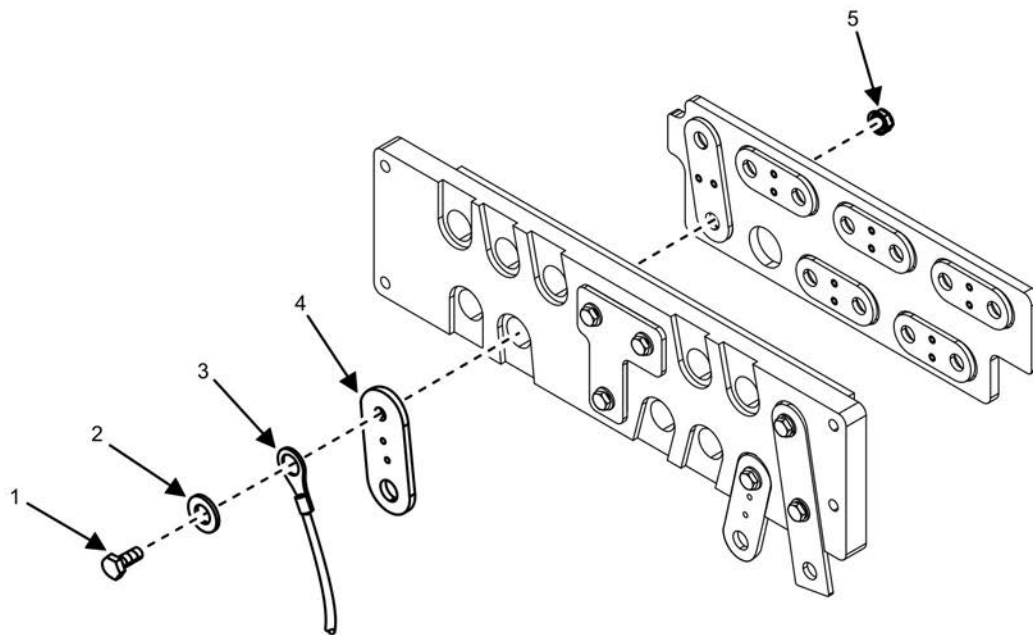


Figure 3. Voltage Selection Board Wiring — Removal.

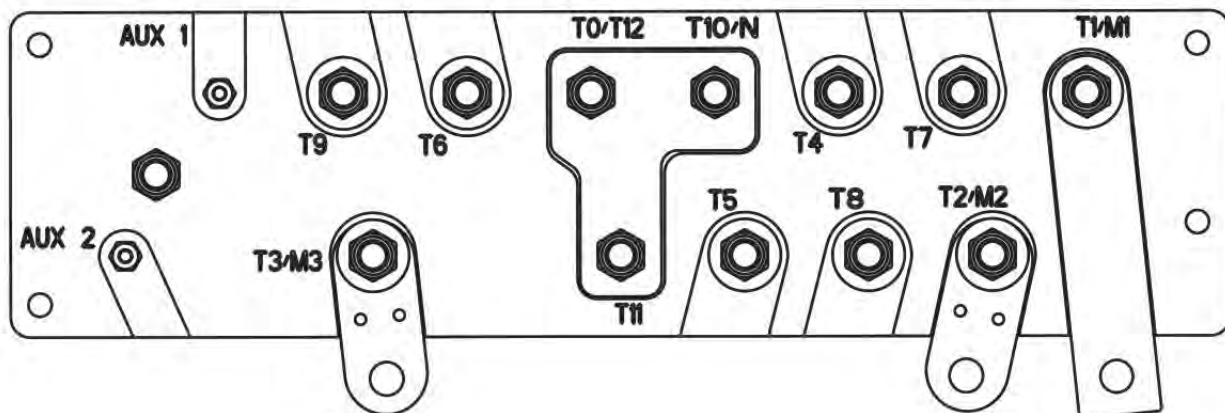


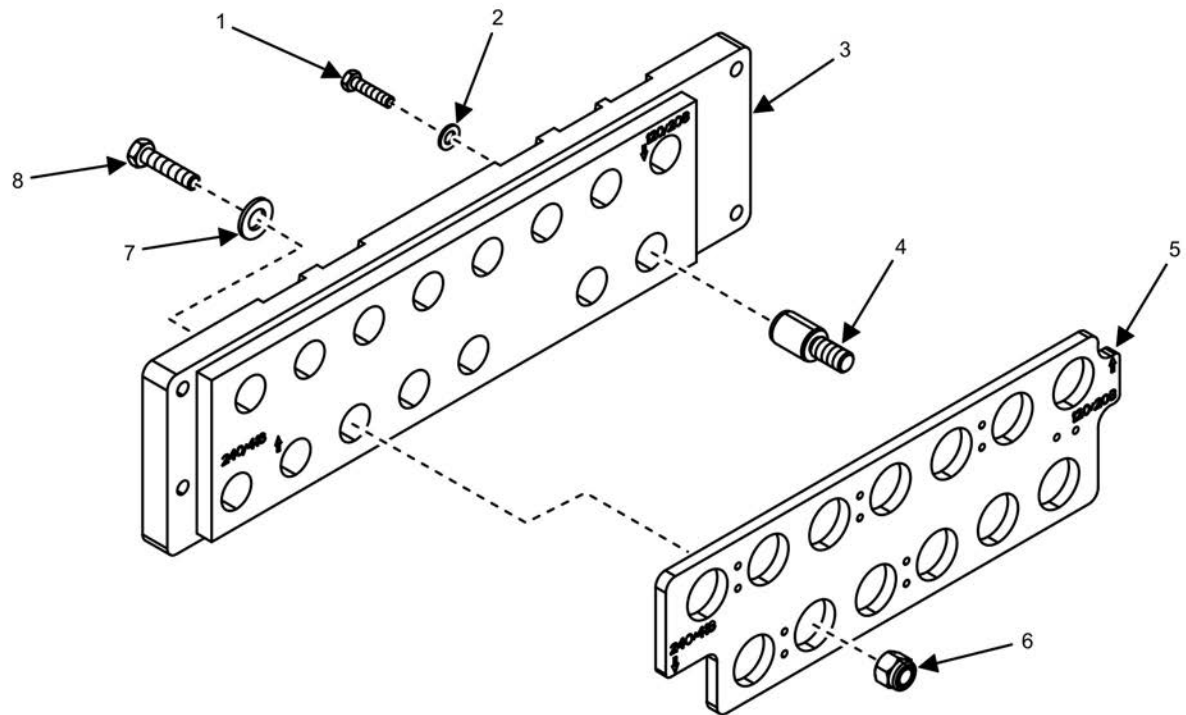
Figure 4. Voltage Selection Board Wiring Labels.

### Inspect Voltage Selection Board

1. Inspect voltage selection board (Figure 2, Item 3) for cracks or other signs of obvious damage.
2. Repair voltage selection board (Figure 2, Item 3) as required. See Disassemble Voltage Selection Board task.
3. Inspect four busbars (Figure 3, Item 4) for cracks and other obvious signs of damage.
4. Replace busbars (Figure 3, Item 4) as required.

### END OF TASK

### Disassemble Voltage Selection Board



**Figure 5. Voltage Selection Board — Disassembly.**

### NOTE

Repairing the voltage selection board (Figure 2, Item 3) requires disassembly of the board and replacement of damaged parts. Note the proper orientation of the voltage selection front board (Figure 5, Item 5) and voltage selection rear board (Figure 5, Item 3) for assembly.

1. Remove any remaining bolts (Figure 5, Item 8), lock nuts (Figure 5, Item 6), and flat washers (Figure 5, Item 7) on voltage selection front board (Figure 5, Item 5) and voltage selection rear board (Figure 5, Item 3).
2. Remove two auxiliary bolts (Figure 5, Item 1), flat washers (Figure 5, Item 2), and threaded inserts (Figure 5, Item 4) from voltage selection rear board (Figure 2, Item 3).
3. Separate voltage selection front board (Figure 5, Item 5) and voltage selection rear board (Figure 5, Item 3).
4. Inspect voltage selection front board (Figure 5, Item 5) for damaged or loose busbars, cracks, and other obvious signs of damage and replace as required.

5. Inspect voltage selection rear board (Figure 5, Item 3) for cracks and other obvious signs of damage and replace as required.
6. Inspect two auxiliary bolts (Figure 5, Item 1), flat washers (Figure 5, Item 2), and threaded inserts (Figure 5, Item 4) for damaged or worn threads and replace as required.

#### END OF TASK

#### Assemble Voltage Selection Board

1. Install two threaded inserts (Figure 5, Item 4) to voltage selection rear board (Figure 5, Item 3).
2. Position voltage selection front board (Figure 5, Item 5) and voltage selection rear board (Figure 5, Item 3).
3. Ensure voltage selection front board (Figure 5, Item 5) and voltage selection rear board (Figure 5, Item 3) are correctly configured.
4. Insert two auxiliary bolts (Figure 5, Item 1), flat washers (Figure 5, Item 2), and threaded inserts (Figure 5, Item 4) in voltage selection rear board (Figure 5, Item 3).
5. Tighten two auxiliary bolts (Figure 5, Item 1) to 27 in/lb (3 Nm).
6. Continue to Install Voltage Selection Board task.

#### END OF TASK

#### Install Voltage Selection Board

1. Position four busbars (Figure 3, Item 4) to locations on voltage selection board (Figure 2, Item 3).

#### NOTE

When more than one electrical lead is connected to a stud on voltage selection board (Figure 2, Item 3), the electrical lead with the heaviest terminal lug shall be installed closest to the voltage selection board (Figure 2, Item 3) with the following electrical leads terminal lugs progressively decreasing in size.

2. Position all electrical leads (Figure 3, Item 3) to previously tagged location on voltage selection board (Figure 2, Item 3).
3. Install 13 bolts (Figure 3, Item 1), flat washers (Figure 3, Item 2), and 12 lock nuts (Figure 3, Item 5) to voltage selection board (Figure 2, Item 3).

#### NOTE

To tighten hardware, lock nut (Figure 3, Item 5) must be secured while tightening bolt (Figure 3, Item 1) opposite end. Two wrenches are required to tighten lock nuts (Figure 3, Item 5).

4. Tighten lock nuts (Figure 3, Item 5) to 124 – 159 in/lb (14 – 18 Nm).
5. Position voltage selection board (Figure 2, Item 3) to spacers (Figure 2, Item 1) in output box.
6. Install voltage selection board (Figure 2, Item 3) to spacers (Figure 2, Item 1) with four screws (Figure 2, Item 2). Tighten screws (Figure 2, Item 2) to 87 – 105 in/lb (10 – 12 Nm).
7. Position three contactor electrical leads (Figure 2, Item 6) to previously tagged locations on voltage selection board (Figure 2, Item 3).
8. Install contactor electrical leads (Figure 2, Item 6) with three bolts (Figure 2, Item 4), flat washers (Figure 2, Item 5), and new lock nuts (Figure 2, Item 7).
9. Tighten each bolt (Figure 2, Item 4) to 124 – 153 in/lb (14 – 18 Nm).

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**NOTE**

The following step is only for 400 Hz on UOC 98P generator set. Continue to step 11 if installing the voltage selection board (Figure 2, Item 3) to the 50/60 Hz UOC 98N.

10. Install 400 Hz circuit breaker (WP 0065, Remove/Install Circuit Breaker).
11. Position output box upper guard (not shown) over output box.
12. Install upper output box guard (not shown) over output box with four screws (not shown).
13. Torque screws (not shown) securing upper output box guard (not shown) to 86 – 105 in/lb (10 – 12 Nm).
14. Install right-side body panel (WP 0033, Remove/Install Right-Side Body Panel).
15. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
16. Close generator set doors.
17. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
18. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
19. Repair as required.
20. Remove identification tags.

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL CONVENIENCE RECEPTACLE**

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**INITIAL SETUP:****Tools and Special Tools**

Screwdriver, Torx, T20, 3" Long (WP 0179, Table 2, Item 22)

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0179, Table 2, Item 40)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Boot, terminal circuit breaker (WP 0125, Repair Parts List, Figure 20, Item 27)

Interrupter, ground fault 50/60 Hz (WP 0125, Figure 20, Item 29)

Interrupter, ground fault 400 Hz (WP 0125, Figure 20, Item 30)

Receptacle, duplex (WP 0125, Figure 20, Item 15)

Washer lock, #8 EXT, tooth (WP 0125, Figure 20, Item 3)

Washer, lock, 1/4 EXT tooth (WP 0125, Figure 20, Item 10)

**Materials/Parts**

Grease, electrically conductive (WP 0180, Expendable and Durable Items List, Item 22)

Tag, marker (WP 0180, Item 37)

**Personnel Required**

91D (1)

**References**

WP 0033, Remove/Install Right-Side Body Panels

WP 0059, Remove/Install Output Terminal Board

WP 0063, Remove/Install Printed Circuit Board Module

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

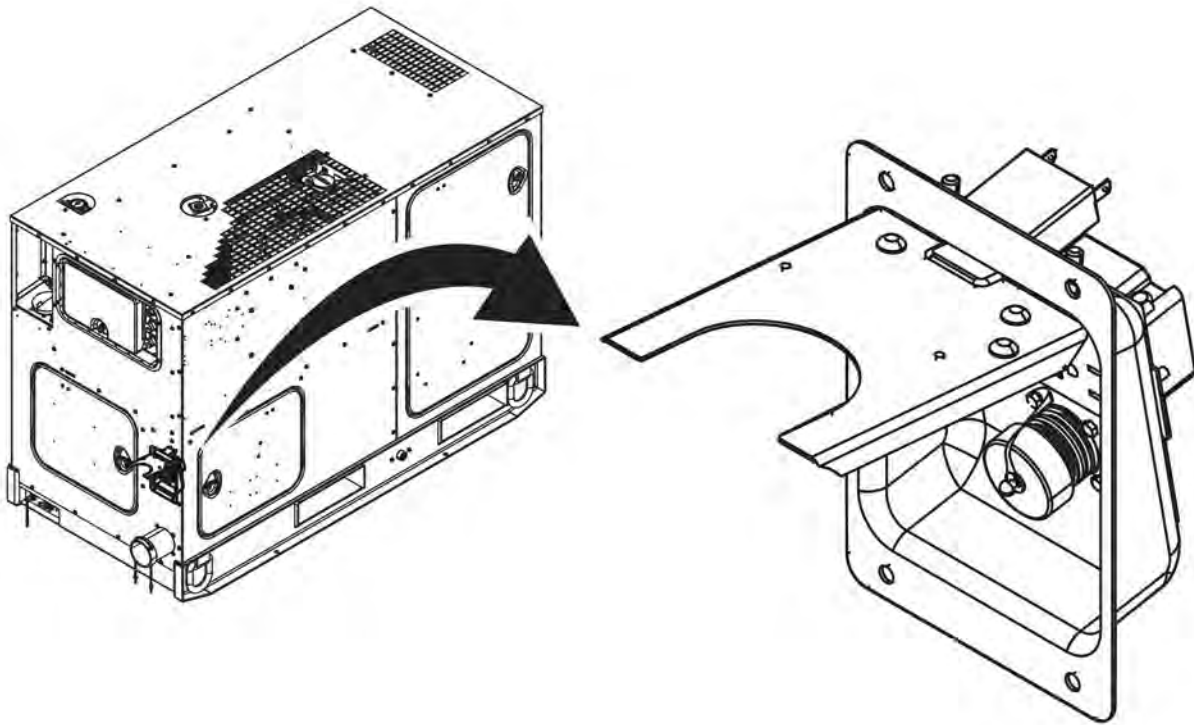
Battery ground cable removed (WP 0037, Remove/Install Batteries)

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**REMOVE/INSTALL CONVENIENCE RECEPTACLE**
**WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.

## Remove Convenience Receptacle Housing



**Figure 1. Convenience Receptacle — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate convenience receptacle (Figure 1) on rear body panel of generator set.
3. Remove four screws (not shown) that secure upper output box guard (not shown) over output box.
4. Remove upper output box guard from output box.
5. Remove four screws (Figure 3, Item 9) securing convenience receptacle housing (Figure 3, Item 8) to rear panel.
6. Position convenience receptacle housing (Figure 3, Item 8) to gain access to wiring on rear of housing.

### NOTE

To assist installation, tag all wires and connectors prior to removal.

7. Loosen captive screw (not shown) and tag and remove GND wire (Figure 2, Item 8) from convenience receptacle (Figure 2, Item 9).

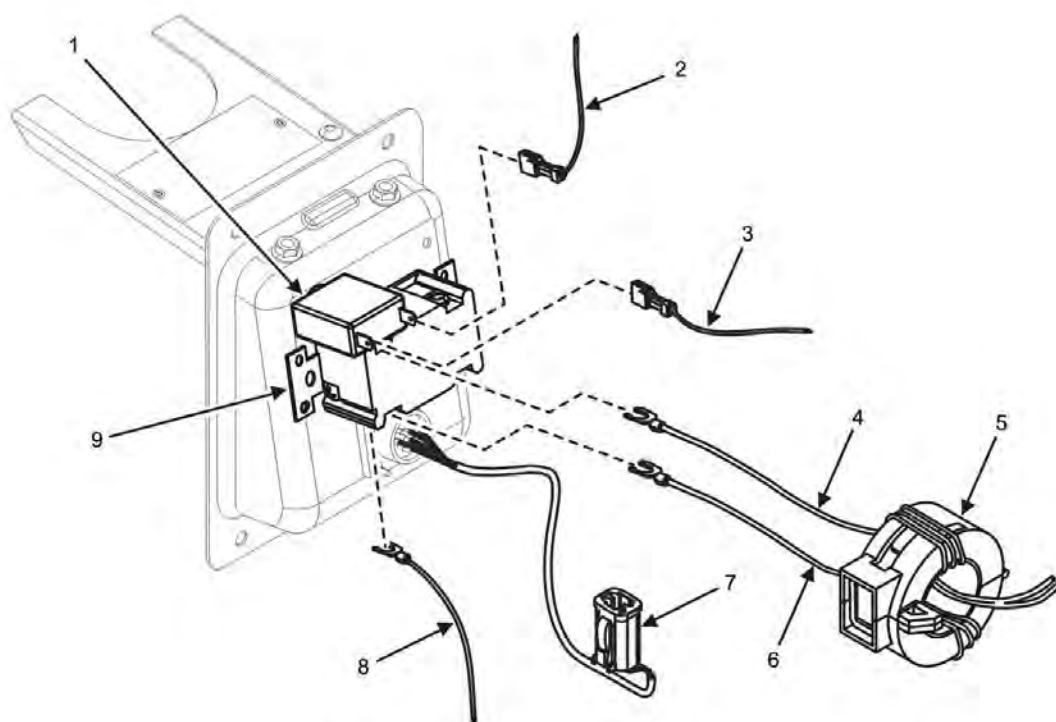
### NOTE

Two GFI wires (Figure 2, Items 4 and 6) pass through GFI choke filter (Figure 2, Item 5) three times.

8. Loosen captive screw (not shown) and tag and remove GFI wire (Figure 2, Item 6) from convenience receptacle (Figure 2, Item 9).



9. Tag and remove relay wire (Figure 2, Item 3) and GFI wire (Figure 2, Item 2) from rear of circuit breaker (Figure 2, Item 1).



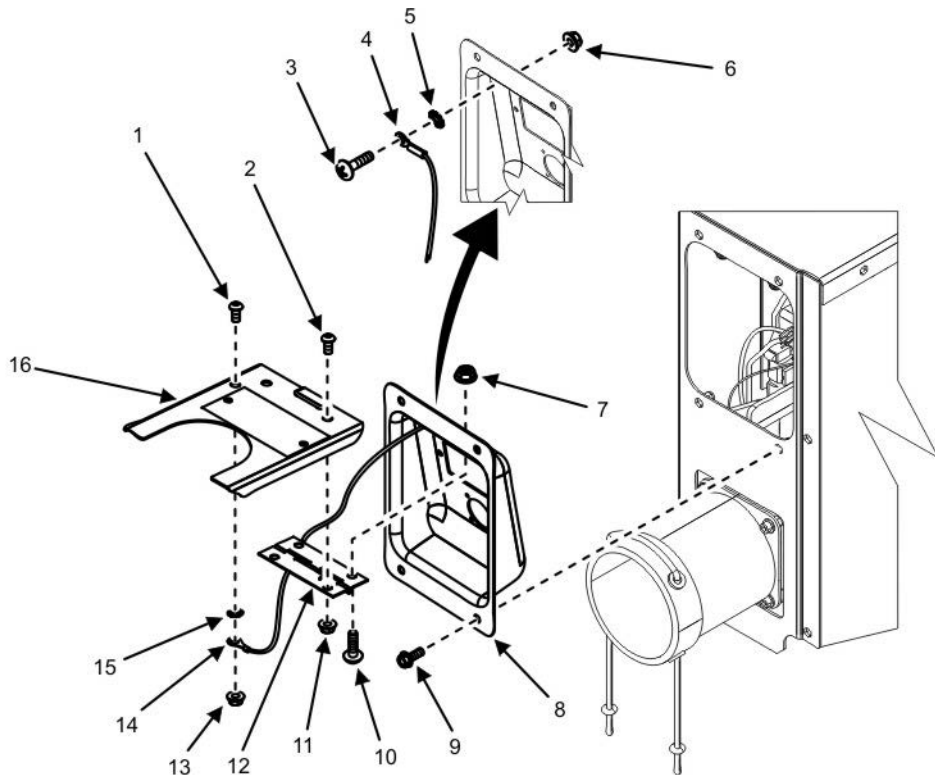
**Figure 2. Convenience Receptacle Rear — Removal.**

10. Loosen captive screw (not shown) and remove GFI wire (Figure 2, Item 4) from convenience receptacle (Figure 2, Item 9).
11. Tag and disconnect switch box contactor receptacle wiring harness (Figure 2, Item 7) at printed circuit board module (not shown) (WP 0063, Remove/Install Printed Circuit Board Module).
12. Remove convenience receptacle housing (Figure 3, Item 8) from rear panel and place on suitable surface.

## END OF TASK

### Disassemble Convenience Receptacle Housing

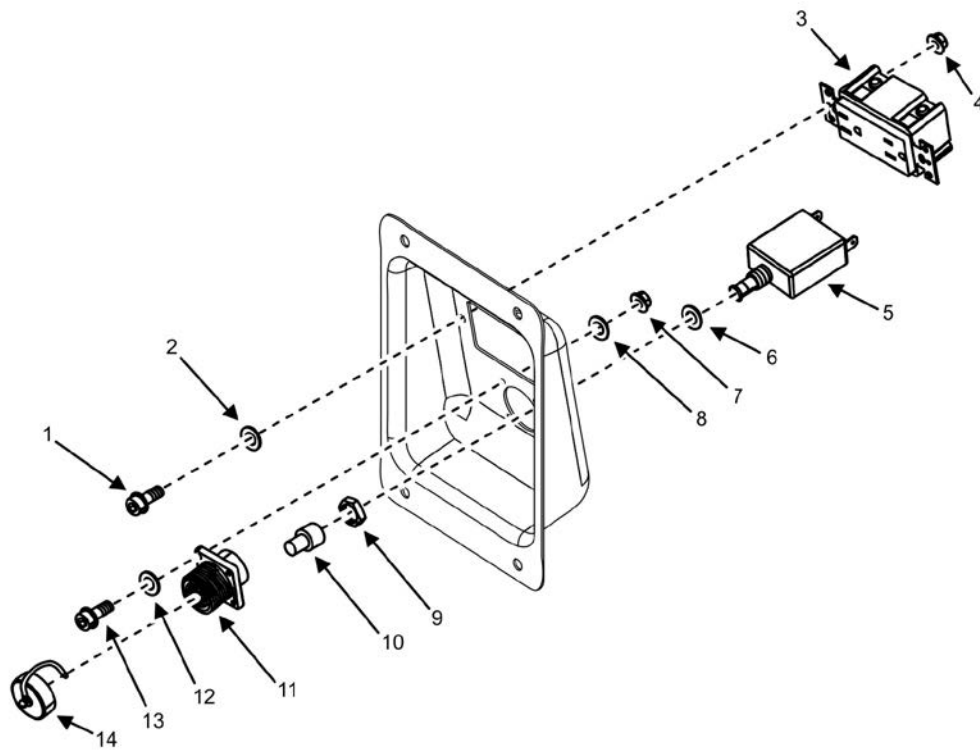
1. Remove screw (Figure 3, Item 3), external tooth lock washer (Figure 3, Item 5), and nut (Figure 3, Item 6) that secure ground strap (Figure 3, Item 4) to back of convenience receptacle housing (Figure 3, Item 8).
2. Discard external tooth lock washer (Figure 3, Item 5).
3. Remove screw (Figure 3, Item 1), external tooth lock washer (Figure 3, Item 15), and nut (Figure 3, Item 13) that secure ground strap (Figure 3, Item 14) to convenience receptacle housing cover (Figure 3, Item 16).
4. Discard external tooth lock washer (Figure 3, Item 15).
5. Remove two screws (Figure 3, Item 10) and two nuts (Figure 3, Item 7) that secure convenience receptacle housing cover (Figure 3, Item 16) and hinge (Figure 3, Item 12) to convenience receptacle housing (Figure 3, Item 8).
6. Remove two screws (Figure 3, Item 2) and two nuts (Figure 3, Item 11) that attach convenience receptacle housing cover (Figure 3, Item 16) to hinge (Figure 3, Item 12).



**Figure 3. Convenience Receptacle — Removal.**

7. Remove four nuts (Figure 4, Item 7) and four flat washers (Figure 4, Item 8) that secure switch box contactor receptacle (Figure 4, Item 11) and cap (Figure 4, Item 14) to convenience receptacle housing (Figure 3, Item 8).
8. Remove four screws (Figure 4, Item 13) and four flat washers (Figure 4, Item 12) that secure switch box contactor receptacle (Figure 4, Item 11) and cap (Figure 4, Item 14) to convenience receptacle housing (Figure 3, Item 8).
9. Remove switch box contactor receptacle (Figure 4, Item 11) and cap (Figure 4, Item 14) from convenience receptacle housing (Figure 3, Item 8).
10. Remove circuit breaker boot (Figure 4, Item 10), mounting nut (Figure 4, Item 9), and washer (Figure 4, Item 6) that secure circuit breaker (Figure 4, Item 5) to convenience receptacle housing (Figure 3, Item 8).
11. Discard circuit breaker boot (Figure 4, Item 10).
12. Remove two screws (Figure 4, Item 1), two flat washers (Figure 4, Item 2), and two flange nuts (Figure 4, Item 4) that secure convenience receptacle (Figure 4, Item 3) to convenience receptacle housing (Figure 3, Item 8).
13. Remove convenience receptacle (Figure 4, Item 3) from convenience receptacle housing (Figure 3, Item 8).

**END OF TASK**



**Figure 4. Convenience Receptacle Components — Removal.**

### **Inspect Convenience Receptacle**

1. Inspect convenience receptacle housing (Figure 3, Item 8) for dents, cracks, or other signs of damage and replace as required.
2. Inspect convenience receptacle housing cover (Figure 3, Item 16) for dents, cracks, or other signs of damage. Replace as required.
3. Inspect hinge (Figure 3, Item 12) for functionality and replace as required.
4. Inspect switch box contactor receptacle (Figure 4, Item 11) for signs of damage and replace as required.
5. Inspect switch box contactor receptacle wiring harness (Figure 2, Item 7) for frayed wires and other signs of damage. Replace switch box contactor receptacle (Figure 4, Item 11) as required.
6. Inspect convenience receptacle (Figure 4, Item 3) for cracks and damage and replace as required.
7. Inspect circuit breaker (Figure 4, Item 5) for cracks and damage and replace as required.
8. Inspect all wires for damage and replace as required.
9. Inspect all mounting hardware and replace as required.

### **END OF TASK**

### **Assemble Convenience Receptacle Housing**

1. Position convenience receptacle (Figure 4, Item 3) to mounting position on convenience receptacle housing (Figure 3, Item 8).

2. Secure convenience receptacle (Figure 4, Item 3) to convenience receptacle housing (Figure 3, Item 8) by installing two screws (Figure 4, Item 1), two flat washers (Figure 4, Item 2), and two flange nuts (Figure 4, Item 4). Tighten flange nuts (Figure 4, Item 4) to 27 – 35 in/lb (3 – 4 Nm).
3. Position circuit breaker (Figure 4, Item 5) to mounting position on convenience receptacle housing (Figure 3, Item 8).
4. Secure circuit breaker (Figure 4, Item 5) to convenience receptacle housing (Figure 3, Item 8) by installing washer (Figure 4, Item 6), mounting nut (Figure 4, Item 9), and new circuit breaker boot (Figure 4, Item 10).
5. Position switch box contactor receptacle (Figure 4, Item 11) and cap (Figure 4, Item 14) to mounting position on convenience receptacle housing (Figure 3, Item 8).
6. Install switch box contactor receptacle (Figure 4, Item 11) with four screws (Figure 4, Item 13) and four flat washers (Figure 4, Item 12) to front of switch box contactor receptacle (Figure 4, Item 11).
9. Install four flat washers (Figure 4, Item 8) and four nuts (Figure 4, Item 7) to rear of switch box contactor receptacle (Figure 4, Item 11). Tighten four nuts (Figure 4, Item 7).
10. Install two screws (Figure 3, Item 2) and two nuts (Figure 3, Item 11) that attach convenience receptacle housing cover (Figure 3, Item 16) and hinge (Figure 3, Item 12). Tighten screws (Figure 3, Item 2) to 87 – 105 in/lb (10 – 12 Nm).
11. Install two screws (Figure 3, Item 10) and two nuts (Figure 3, Item 7) that secure convenience receptacle housing cover (Figure 3, Item 16) and hinge (Figure 3, Item 12) to convenience receptacle housing (Figure 3, Item 8). Tighten screws (Figure 3, Item 10) to 87 – 105 in/lb (10 – 12 Nm).
12. Install screw (Figure 3, Item 1), new external tooth lock washer (Figure 3, Item 15), and nut (Figure 3, Item 13) that secure ground strap (Figure 3, Item 14) to convenience receptacle housing cover (Figure 3, Item 16). Tighten screws (Figure 3, Item 1) to 87 – 105 in/lb (10 – 12 Nm).
13. Install screw (Figure 3, Item 3), new external tooth lock washer (Figure 3, Item 5), and nut (Figure 3, Item 6) that secure ground strap (Figure 3, Item 4) to back of convenience receptacle housing (Figure 3, Item 8). Tighten screws (Figure 3, Item 3) to 25 – 39 in/lb (3 – 4 Nm).

## END OF TASK

### Install Convenience Receptacle Housing

1. Position convenience receptacle housing (Figure 3, Item 8) to mounting position on rear panel.

## NOTE

Use tags installed on electrical wires and connectors prior to removal as a guide at installation. Remove tags once components have been installed.

Two GFI wires (Figure 2, Items 4 and 6) pass through GFI choke filter (Figure 2, Item 5) three times.

2. Install two GFI wires (Figure 2, Items 4 and 6) to convenience receptacle (Figure 2, Item 9) and secure with screws (not shown), ensuring each GFI wire (Figure 2, Items 4 and 6) passes through GFI choke filter (Figure 2, Item 5) three times.
3. Install GND wire (Figure 2, Item 8) to convenience receptacle (Figure 2, Item 9).
4. Secure convenience receptacle housing (Figure 3, Item 8) to rear panel by installing four screws (Figure 3, Item 9).
5. Install GFI wire (Figure 2, Item 2) and relay wire (Figure 2, Item 3) to circuit breaker (Figure 2, Item 1).
6. Connect switch box contactor receptacle wiring harness (Figure 2, Item 7) to printed circuit board using identification tags installed during removal as a guide (WP 0058, Remove/Install Printed Circuit Board Module).

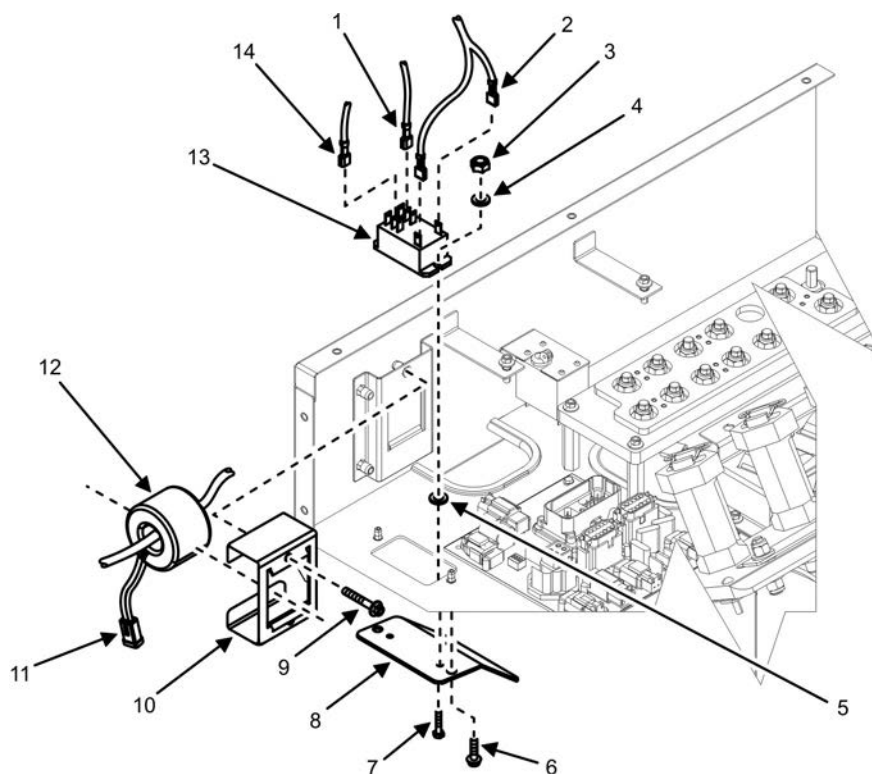
7. Tighten four screws (Figure 3, Item 9) to 87 – 105 in/lb (10 – 12 Nm).
8. Position upper output box guard (not shown) over output box.
9. Secure upper output box guard (not shown) with four screws (not shown).
10. Tighten four screws (not shown) to 87 – 105 in/lb (10 – 12 Nm).
11. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
12. Close generator set doors.
13. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
14. Start engine and check for proper operation (TM 9-6115-752-10).
15. Repair as required.

## END OF TASK

### Remove Convenience Receptacle Relay and/or Current Transformer

#### NOTE

Figure 5 shows output box on its side to aid in visualization.



**Figure 5. Convenience Receptacle Relay and Current Transformer — Removal.**

1. Remove right-side body panel (WP 0033, Remove/Install Right-Side Body Panels).
2. Open rear access door.
3. Tag and remove relay wire (Figure 5, Item 1) from relay (Figure 5, Item 13) and current transformer (Figure 5, Item 12).

4. Tag and remove voltage selection board wire (Figure 5, Item 14) from relay (Figure 5, Item 13) and current transformer (Figure 5, Item 12).
5. Tag and remove transformer electrical harness (Figure 5, Item 11) from printed circuit board module (not shown).

### CAUTION

Current transformer (Figure 5, Item 12) is polarity sensitive indicated by a dot on one end of the transformer. The current transformer (Figure 5, Item 12) must be installed using the same polarity as it was removed. Failure to install the current transformer (Figure 5, Item 12) using correct polarity may cause damage to equipment.

6. Observe and note polarity of current transformer (Figure 5, Item 12) before removal.
7. Remove two screws (Figure 5, Item 9) securing transformer bracket (Figure 5, Item 10) to output box.
8. Remove current transformer (Figure 5, Item 12) and transformer bracket (Figure 5, Item 10) from output box and place on suitable surface.
9. Tag and remove relay wire (Figure 5, Item 14) from relay (Figure 5, Item 13).
10. Remove two screws (Figure 5, Item 6) that attach GFI bracket (Figure 5, Item 8) to mounting panel in output box.
11. Remove two screws (Figure 5, Item 7), two washers (Figure 5, Item 5), two nuts (Figure 5, Item 3), and two washers (Figure 5, Item 4) securing relay (Figure 5, Item 13) to GFI bracket (Figure 5, Item 8).
12. Position GFI bracket (Figure 5, Item 8) to prevent strain on GFI (Figure 8, Item 1) wires.
13. Remove relay (Figure 5, Item 13) and place on suitable surface.

### END OF TASK

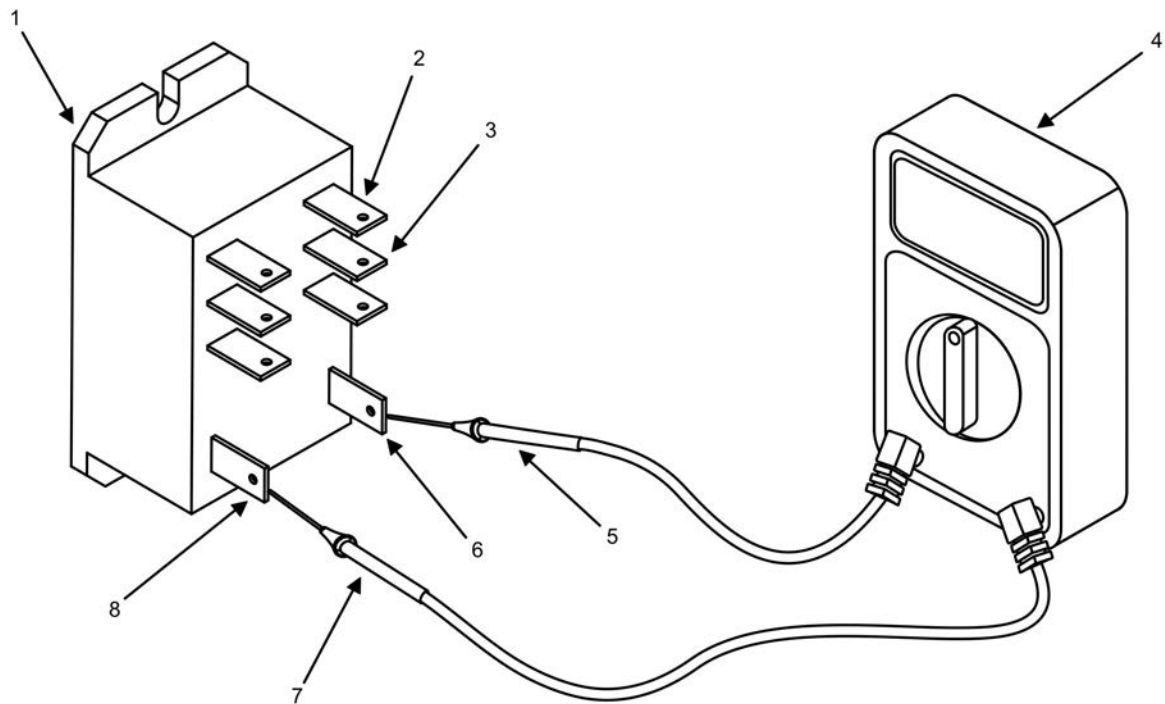
#### Test Convenience Receptacle Relay and Current Transformer

1. Inspect relay (Figure 6, Item 1) for signs of damage, evidence of heat, or odor of burned insulation. Replace as required.
2. Place relay (Figure 6, Item 1) in a position that exposes all terminals.
3. Select Ohms function on multimeter (Figure 6, Item 4).
4. Touch either meter probe (Figure 6, Item 7 or 5) to relay terminal (Figure 6, Item 6).
5. Touch second meter probe (Figure 6, Item 7 or 5) to second relay terminal (Figure 6, Item 8).
6. Observe and note value of resistance.
7. Touch either meter probe (Figure 6, Item 7 or 5) to relay terminal (Figure 6, Item 2).
8. Touch second meter probe (Figure 6, Item 7 or 5) to relay terminal (Figure 6, Item 3).
9. Observe and note value of resistance.

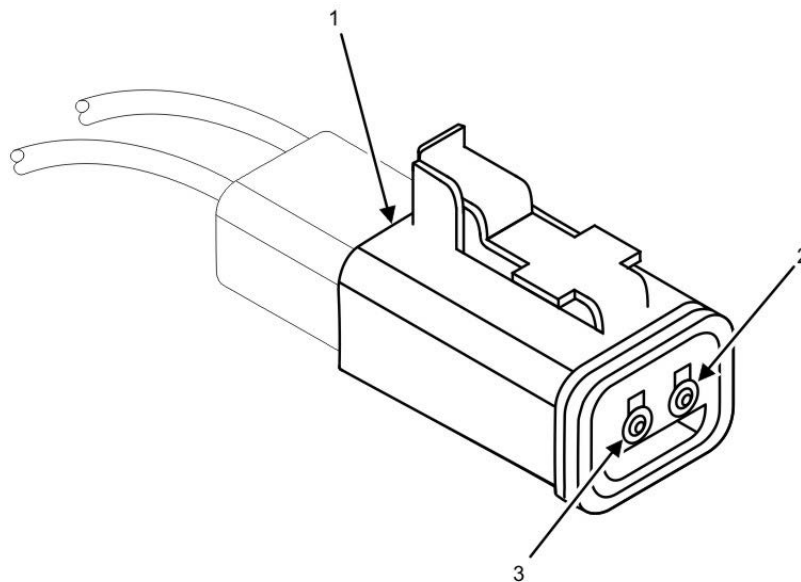
### NOTE

Resistance value obtained in step 5 should be  $350\Omega \pm 10\%$ . Resistance value obtained in step 8 should be infinity.

10. Compare resistance values obtained in step 5 and step 8 to specifications to determine if relay (Figure 6, Item 1) requires replacement. Replace as required.



**Figure 6. Convenience Receptacle Relay — Test.**



**Figure 7. Convenience Receptacle Current Transformer — Test.**

11. Inspect current transformer (Figure 5, Item 12) and wiring plug (Figure 7, Item 1) for signs of damage, evidence of heat, odor of burned insulation, frayed wires, and missing wiring plug components. Replace as required.
12. Touch either meter probe (Figure 6, Item 7 or 5) to either wiring plug (Figure 7, Item 1) connector (Figure 7, Item 2 or 3).

13. Touch second meter probe (Figure 6, Item 7 or 5) to wiring plug (Figure 7, Item 1) connector (Figure 7, Item 2 or 3).
14. Observe and note value of resistance.

### NOTE

Resistance value obtained in step 12 should be  $0.8 \Omega \pm 10\%$ . Accuracy of a multimeter is unreliable when measuring values lower than  $1 \Omega$ . A measurement value greater than  $2 \Omega$  indicates a defective current transformer (Figure 5, Item 12).

15. Compare resistance value obtained in step 12 to specifications to determine if current transformer (Figure 5, Item 12) requires replacement. Replace as required.

### END OF TASK

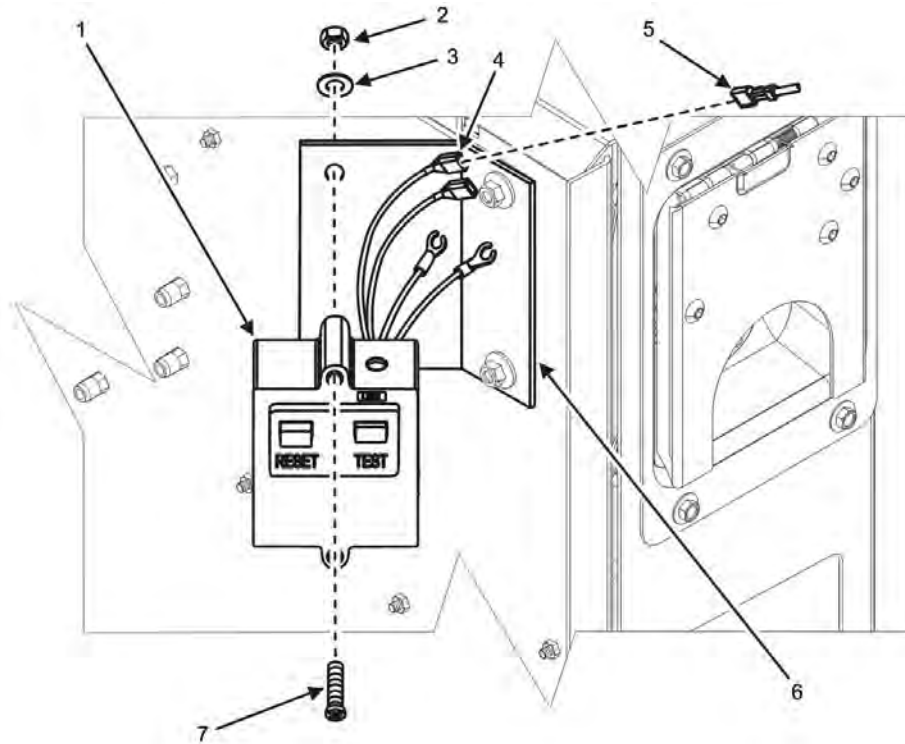
#### Install Convenience Receptacle Relay and/or Current Transformer

1. Perform Test Convenience Receptacle Relay and Current Transformer task if either relay (Figure 5, Item 13) or current transformer (Figure 5, Item 12) are new replacements.
2. Position relay (Figure 5, Item 13) to mounting location on GFI bracket (Figure 5, Item 8).
3. Install two screws (Figure 5, Item 7), two washers (Figure 5, Item 5), two nuts (Figure 5, Item 3), and two washers (Figure 5, Item 4) to attach relay (Figure 5, Item 13) to GFI bracket (Figure 5, Item 8). Tighten two screws (Figure 5, Item 7).
4. Install and tighten two screws (Figure 5, Item 6) that attach GFI bracket (Figure 5, Item 8) to mounting panel in output box.
5. Install relay electrical harness (Figure 5, Item 2) to relay (Figure 5, Item 13) using identification tags installed during removal as a guide.
6. Install voltage selection board wire (Figure 5, Item 1) to relay (Figure 5, Item 13) using identification tags installed during removal as a guide.
7. Position transformer bracket (Figure 5, Item 10) and current transformer (Figure 5, Item 12), using correct polarity noted during removal, to mounting location on output box panel.
8. Install and tighten two screws (Figure 5, Item 9) to attach transformer bracket (Figure 5, Item 10) to output box.
9. Install relay wire (Figure 5, Item 14) through opening in current transformer (Figure 5, Item 12).
10. Install relay wire (Figure 5, Item 14) to relay (Figure 5, Item 13).
11. Install transformer electrical harness (Figure 5, Item 11) into printed circuit board module (not shown).
12. Install right-side body panel (WP 0033, Remove/Install Right-Side Body Panels).
13. Close rear access door.
14. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
15. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
16. Start engine and check for proper operation (TM 9-6115-752-10).
17. Repair as required.

### END OF TASK



# Remove Convenience Receptacle GFI



**Figure 8. Convenience Receptacle GFI — Removal.**

## **NOTE**

Tag all wires and connectors prior to removal as a guide at installation.

1. Open rear access door.
2. Tag and disconnect two GFI wires (Figure 2, Items 4 and 6) from convenience receptacle (Figure 2, Item 9) and one GFI wire (Figure 2, Item 2) from rear of circuit breaker (Figure 2, Item 1). See Remove Convenience Receptacle Housing and Disassemble Convenience Receptacle Housing tasks.
3. Remove wire (Figure 8, Item 4) of GFI (Figure 8, Item 1) from neutral lead (Figure 8, Item 5).
4. Withdraw four wires through output box opening.
5. Remove two screws (Figure 8, Item 7), two flat washers (Figure 8, Item 3), and two nuts (Figure 8, Item 2) from GFI (Figure 8, Item 1).
6. Remove GFI (Figure 8, Item 1) from mounting bracket (Figure 8, Item 6).
7. Inspect GFI (Figure 8, Item 1), and replace as required.

## **END OF TASK**

---

**Install Convenience Receptacle GFI****NOTE**

Use tags installed on wires and connectors prior to removal as a guide at installation. Remove tags once unit has been reassembled and tested for proper operation.

1. Position GFI (Figure 8, Item 1) to mounting bracket (Figure 8, Item 6), and align mounting holes.
2. Insert two screws (Figure 8, Item 7) through GFI (Figure 8, Item 1) into mounting bracket (Figure 8, Item 6).
3. Install two flat washers (Figure 8, Item 3) and two nuts (Figure 8, Item 2) to rear of GFI (Figure 8, Item 1). Tighten two nuts (Figure 8, Item 2).
4. Insert four wires of GFI (Figure 8, Item 1) through output box opening.
5. Install two wires (Figure 2, Items 4 and 6) to convenience receptacle (Figure 2, Item 9) and one GFI wire (Figure 2, Item 2) to rear of circuit breaker (Figure 2, Item 1) according to tags. See Install Convenience Receptacle Housing and Assemble Convenience Receptacle Housing tasks.
6. Install wire (Figure 8, Item 4) to neutral lead (Figure 8, Item 5).
7. Close rear access door of generator set.
8. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
9. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
10. Start engine and check for proper operation (TM 9-6115-752-10).
11. Repair as required.

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL TRANSFORMERS**

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**INITIAL SETUP:****Test Equipment**

Load Bank (WP 0179, Table 2, Item 2)  
**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0179, Table 2, Item 39)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Nut, self-locking (3) (WP 0123, Repair Parts List, Figure 18, Item 14)

Transformer, current (3) (WP 0126, Repair Parts List, Figure 21, Item 4)

Grease, electrically conductive (WP 0180, Expendable and Durable Items List, Item 22)

**Personnel Required**

91D (1)

**References**

WP 0100, General Maintenance

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

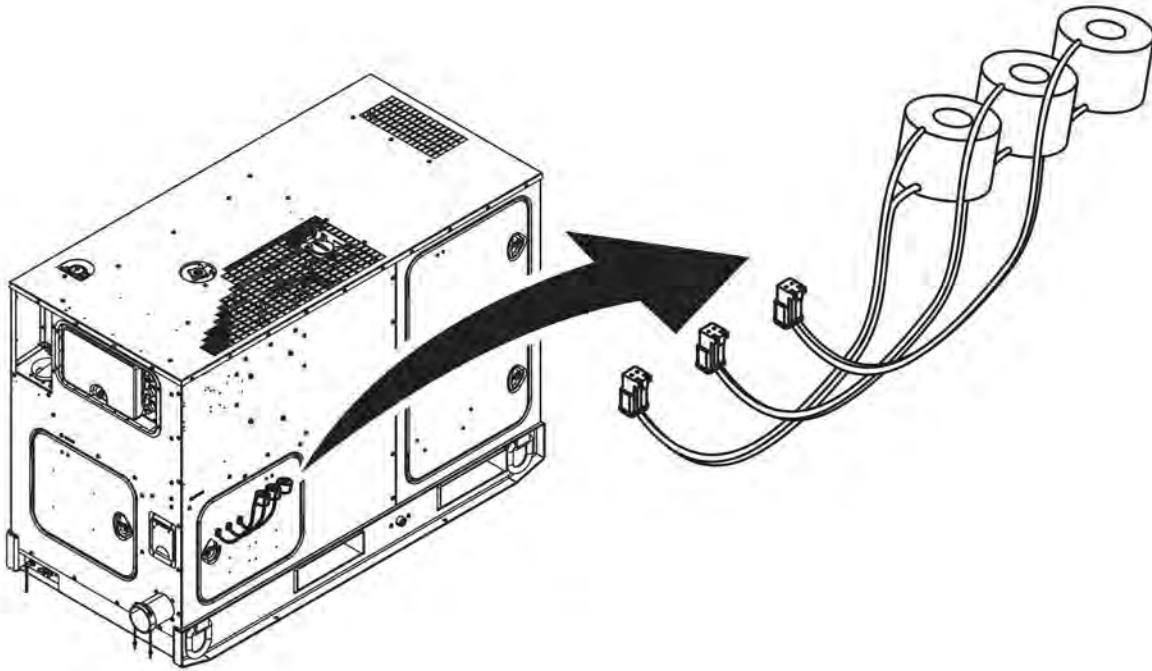
Right-side body panel removed (WP 0033, Remove/Install Right-Side Body Panel)

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**REMOVE/INSTALL TRANSFORMERS****WARNING**

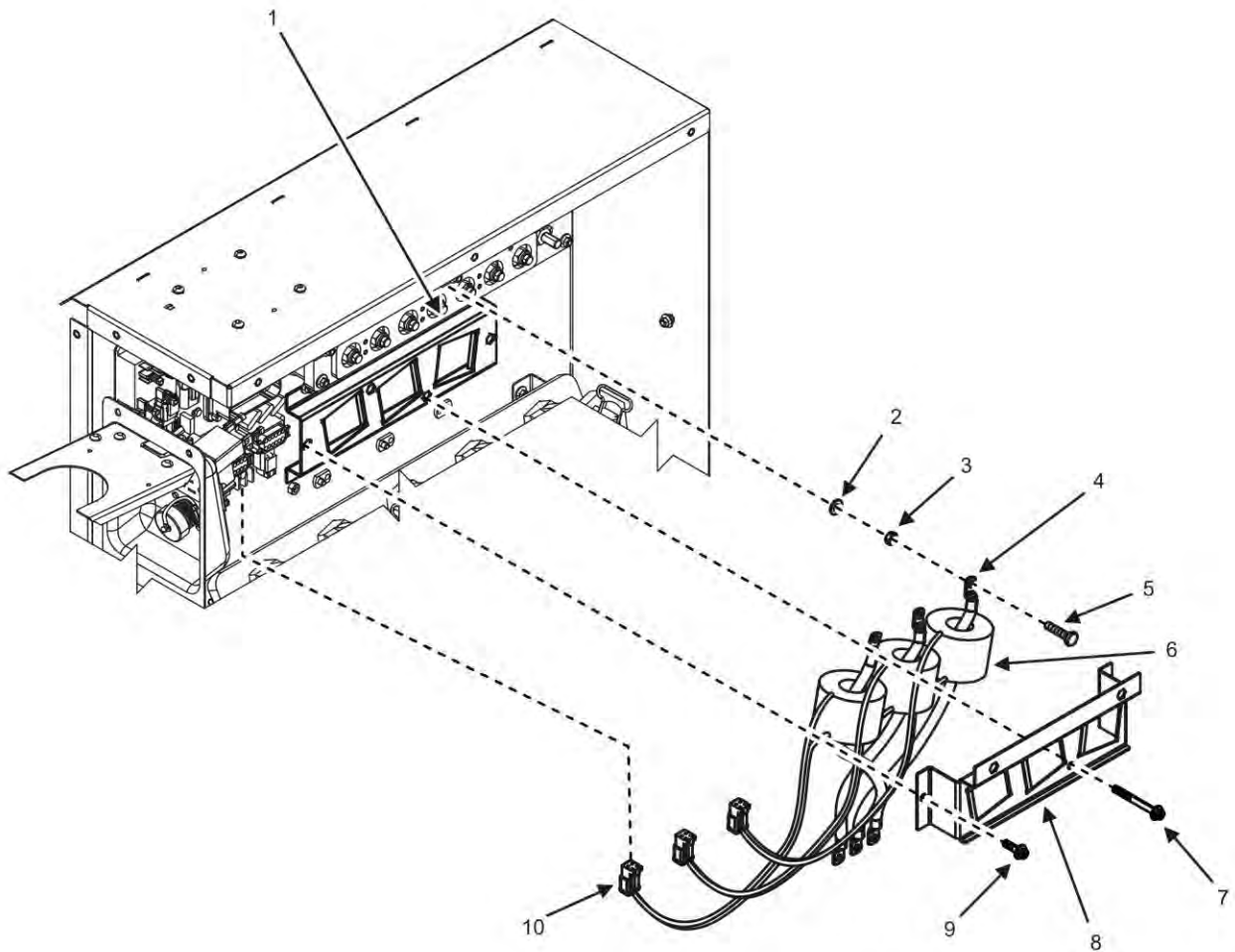
Dangerously high voltage can exist across Current Transformer (CT) output with engine running. CT can explode if disconnected from load with engine running. Do not disconnect CT with Alternating Current (AC) generator rotating. Failure to comply may cause injury or death to personnel by electrocution.

## Remove Transformers



**Figure 1. Transformers — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove four screws (not shown) securing upper output box guard (not shown) over output box.
3. Remove upper output box guard (not shown) from output box.
4. Remove six screws (not shown) securing lower output box guard (not shown) and access door (not shown) over output box.
5. Remove lower output box guard (not shown) and access door (not shown) from output box.
6. Locate transformers (Figure 1).



**Figure 2. Transformer — Detail.**

7. Remove two short screws (Figure 2, Item 9) and two long screws (Figure 2, Item 7) that secure transformer top bracket (Figure 2, Item 8) to transformer bottom bracket (Figure 2, Item 1).
8. Remove transformer top bracket (Figure 2, Item 8) from output box.

### CAUTION

Printed circuit board module (not shown) contains components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit board module. Failure to comply may cause damage to equipment.

### NOTE

Prior to removal, tag all electrical wires. Tags will be used as a guide during installation.

9. Tag and disconnect transformer electrical wires (Figure 2, Item 10) at printed circuit board module (not shown).

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**NOTE**

Transformer electrical wires (Figure 2, Item 10) are permanently attached to transformers (Figure 2, Item 6). If transformer electrical wires (Figure 2, Item 10) are damaged beyond repair, replace transformer (Figure 2, Item 6).

10. Inspect transformer electrical wires (Figure 2, Item 10) and replace transformer (Figure 2, Item 6) if damaged.
11. Tag three electrical wires (Figure 2, Item 4) to voltage selection board (not shown).
12. Remove three bolts (Figure 2, Item 5), flat washers (Figure 2, Item 3), and lock nuts (Figure 2, Item 2) securing electrical wires (Figure 2, Item 4) to voltage selection board (not shown). Discard lock nuts (Figure 2, Item 2).
13. Remove three electrical wires (Figure 2, Item 4) to voltage selection board (not shown).
14. Inspect three electrical wires (Figure 2, Item 4) for damage and repair as required (WP 0100, General Maintenance). Replace electrical wires as required.

**CAUTION**

Orientation of transformers (Figure 2, Item 6) must be tagged prior to removal. X1 marking faces the top of the output box. Transformers are to be installed to the orientation they were removed. Failure to comply may cause damage to equipment.

**NOTE**

Prior to removal, tag orientation of transformers (Figure 2, Item 6). Tags will be used as a guide during reassembly.

15. Tag and remove three transformers (Figure 2, Item 6) from transformer bottom bracket (Figure 2, Item 1) mounted in output box.

**END OF TASK****Inspect Transformers**

1. Inspect transformer bottom bracket (Figure 2, Item 1) for signs of obvious damage. Replace as required.
2. Inspect three transformers (Figure 2, Item 6) for signs of obvious damage. Replace as required.
3. Inspect three transformers (Figure 2, Item 6) by using a multimeter set to test Ohms to check resistance between two sleeves of two electrical wires (Figure 2, Item 10) of each transformer (Figure 2, Item 6).

**NOTE**

A measurement value greater than  $2\Omega$  indicates a defective current transformer (Figure 2, Item 6).

4. Replace any transformer (Figure 2, Item 6) outside of specification.
5. Inspect transformer top bracket (Figure 2, Item 8) in output box for signs of obvious damage. Replace as required.
6. Inspect bolts (Figure 2, Item 5) and flat washers (Figure 2, Item 3) for signs of obvious damage. Replace as required.

**END OF TASK****Install Transformers****CAUTION**

Orientation of transformers (Figure 2, Item 6) must be installed to proper orientation. X1 marking faces the top of the output box. Failure to comply may cause damage to equipment with X1 marking facing the top of the output box.

1. Position three transformers (Figure 2, Item 6) to transformer bottom bracket (Figure 2, Item 1).

**CAUTION**

Printed circuit board module contains components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit board module. Failure to comply may cause damage to equipment.

**NOTE**

Identification tags should remain in place until the output box is completely reassembled and has been tested for proper operation.

Apply a thin coat of electrically conductive grease to all electrical connections prior to assembly.

2. Insert electrical wires (Figure 2, Item 4) through transformers (Figure 2, Item 6) to mounting location on voltage selection board (not shown) using identification tags installed during removal as a guide.
3. Apply a thin coat of electrically conductive grease to electrical connections.
4. Position electrical wires (Figure 2, Item 4) to voltage selection board (not shown) mounting location.
5. Insert bolt (Figure 2, Item 5) through electrical wires (Figure 2, Item 4) and voltage selection board (not shown).
6. Secure electrical wires (Figure 2, Item 4) to voltage selection board (not shown) with three new lock nuts (Figure 2, Item 2) and flat washers (Figure 2, Item 3).

**NOTE**

Lock nut (Figure 2, Item 2) must be held in place while tightening bolt (Figure 2, Item 5) to proper torque value.

7. Tighten bolt (Figure 2, Item 5) to 124 – 159 in/lb (14 – 18 Nm).
8. Connect transformer electrical wires (Figure 2, Item 10) to printed circuit board module (not shown) using identification tags installed during removal as a guide.

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**NOTE**

Transformer top bracket (Figure 2, Item 8) is properly oriented over transformers (Figure 2, Item 6) when the lip is facing the top of the unit.

9. Position transformer top bracket (Figure 2, Item 8) over transformers (Figure 2, Item 6).
10. Secure transformer top bracket (Figure 2, Item 8) with two short screws (Figure 2, Item 9) and two long screws (Figure 2, Item 7).
11. Tighten two short screws (Figure 2, Item 9) and two long screws (Figure 2, Item 7) to 87 – 105 in/lb (10 – 12 Nm).
12. Position lower output box guard (not shown) and access door (not shown) over output box.
13. Install six screws (not shown) securing lower output box guard (not shown) and access door (not shown) over output box.
14. Position upper output box guard (not shown) and access door (not shown) over output box.
15. Install upper output box guard (not shown) over output box with four screws (not shown).
16. Tighten screws (not shown) securing upper and lower output box guards (not shown) to 87 – 105 in/lb (10 – 12 Nm).
17. Install right-side body panel (WP 0033, Remove/Install Right-Side Body Panel).
18. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
19. Close generator set doors.
20. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
21. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
22. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL PRINTED CIRCUIT BOARD MODULE**

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**INITIAL SETUP:**

**Tools and Special Tools**

Strap, Wrist, Electrostatic Discharge (WP 0179, Table 2, Item 23)

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0179, Table 2, Item 40)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Module, printed circuit board (1) (WP 0127, Repair Parts List, Figure 22, Item 3)

Grease, electrically conductive (WP 0180, Expendable and Durable Items List, Item 22)

Tag, marker (WP 0180, Item 37)

**Personnel Required**

91D (1)

**References**

WP 0064, Remove/Install Hour Meter

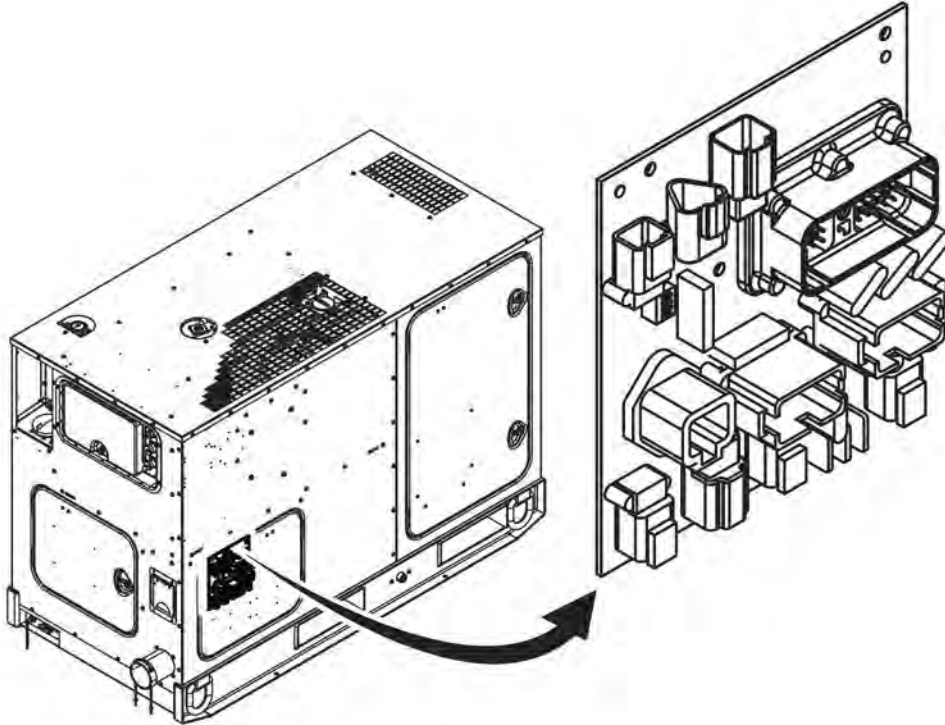
**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Right-side body panel removed (WP 0033, Remove/Install Right-Side Body Panel)

**REMOVE/INSTALL PRINTED CIRCUIT BOARD MODULE****Remove Printed Circuit Board Module**

**Figure 1. Printed Circuit Board Module — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove four screws (not shown) securing upper output box guard (not shown) over output box.
3. Remove upper output box guard (not shown) from output box.
4. Remove six screws (not shown) securing lower output box guard (not shown) and access door (not shown) over output box.
5. Remove lower output box guard (not shown) and access door (not shown) from output box.
6. Locate printed circuit board module (Figure 1).

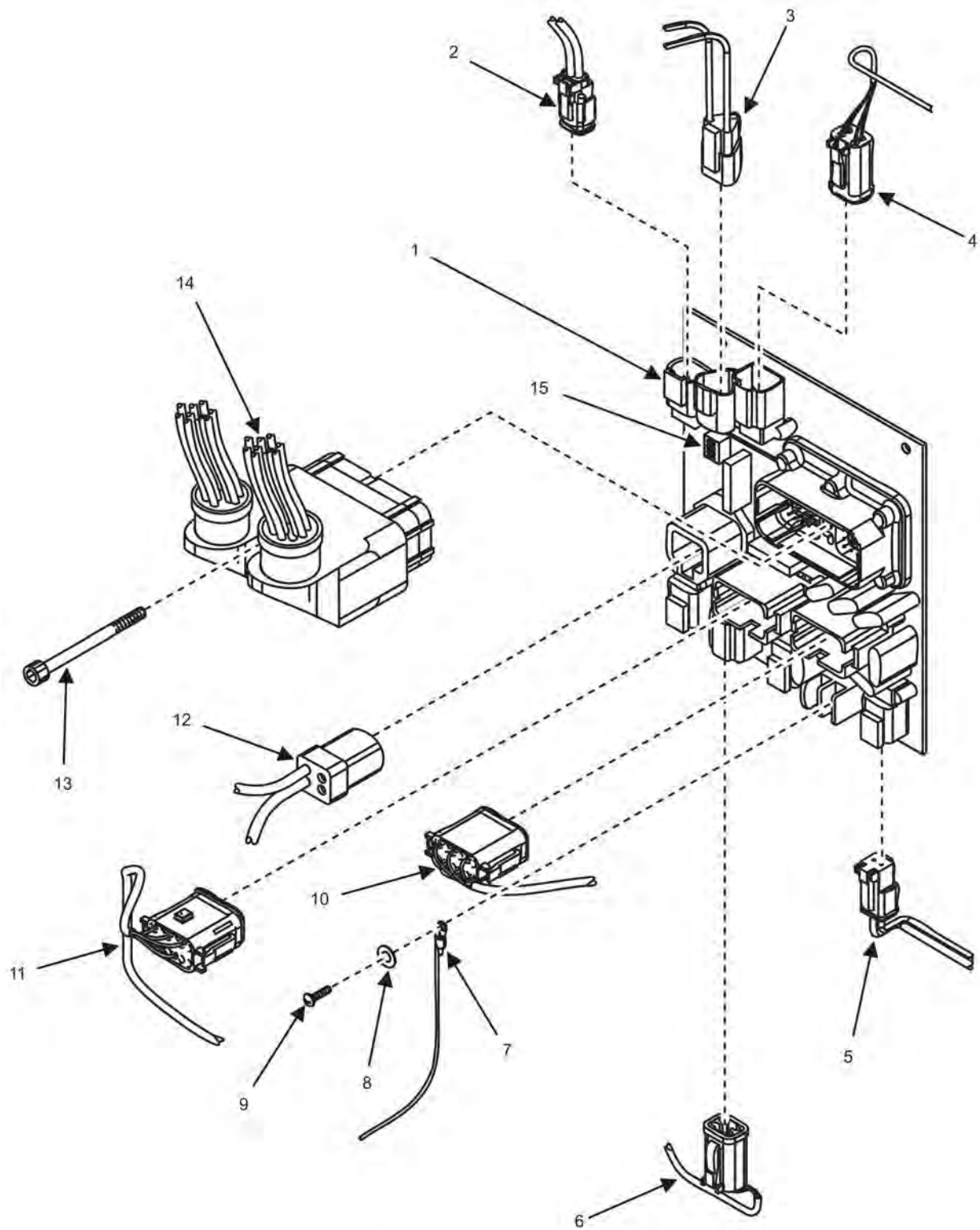


Figure 2. Printed Circuit Board Module Wiring — Removal.

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## CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

## NOTE

Prior to removal, tag and identify all wiring harnesses and electrical leads according to markings on printed circuit board module (Figure 3). Tags will be used as a guide during reassembly.

7. Tag and remove wiring harness (Figure 2, Item 2) from printed circuit board module (Figure 2, Item 1) to top transformer (not shown).
8. Inspect wiring harness (Figure 2, Item 2) for frayed wires and other signs of obvious damage. Replace top transformer (not shown) as required.
9. Tag and remove hour meter wiring harness (Figure 2, Item 3) from printed circuit board module (Figure 2, Item 1) to hour meter (not shown).
10. Inspect hour meter wiring harness (Figure 2, Item 3) for frayed wires and other signs of obvious damage. Replace hour meter as required (WP 0064, Remove/Install Hour Meter).
11. Tag and remove voltage reconnection board wiring harness (Figure 2, Item 4) from printed circuit board module (Figure 2, Item 1) to voltage reconnection board (not shown).
12. Inspect voltage selection board wiring harness (Figure 2, Item 4) for frayed wires and other signs of obvious damage. Replace as required.
13. Tag DCS wiring harness (Figure 2, Item 14) from printed circuit board module (Figure 2, Item 1) to DCS (not shown).
14. Remove screw (Figure 2, Item 13) securing DCS wiring harness (Figure 2, Item 14) to printed circuit board module (Figure 2, Item 1).
15. Remove DCS wiring harness (Figure 2, Item 14) from printed circuit board module (Figure 2, Item 1).
16. Inspect DCS wiring harness (Figure 2, Item 14) for frayed wires and other signs of obvious damage. Replace as required.
17. Tag and remove wiring harness (Figure 2, Item 12) from printed circuit board module (Figure 2, Item 1) to relay (not shown).
18. Inspect wiring harness (Figure 2, Item 12) for frayed wires and other signs of obvious damage. Replace as required.
19. Tag and remove N terminal and contactor wiring harness (Figure 2, Item 11) from printed circuit board module (Figure 2, Item 1) to N terminal (not shown) and contactor (not shown).
20. Inspect N terminal and contactor wiring harness (Figure 2, Item 11) for frayed wires and other signs of obvious damage. Replace as required.
21. Tag and remove wiring harness (Figure 2, Item 10) from printed circuit board module (Figure 2, Item 1) to contactor (not shown) and line terminals (not shown).
22. Inspect wiring harness (Figure 2, Item 10) for frayed wires and other signs of obvious damage. Replace as required.
23. Tag and remove three transformer wiring harnesses (Figure 2, Item 5) from printed circuit board module (Figure 2, Item 1) to three transformers (not shown).
24. Inspect three transformer wiring harnesses (Figure 2, Item 5) for frayed wires and other signs of obvious damage. Replace as required.

25. Tag and remove switch box contactor receptacle wiring harness (Figure 2, Item 6) from printed circuit board module (Figure 2, Item 1) to switch box contactor receptacle (not shown).
26. Inspect switch box contactor receptacle wiring harness (Figure 2, Item 6) for frayed wires and other signs of obvious damage. Replace as required.

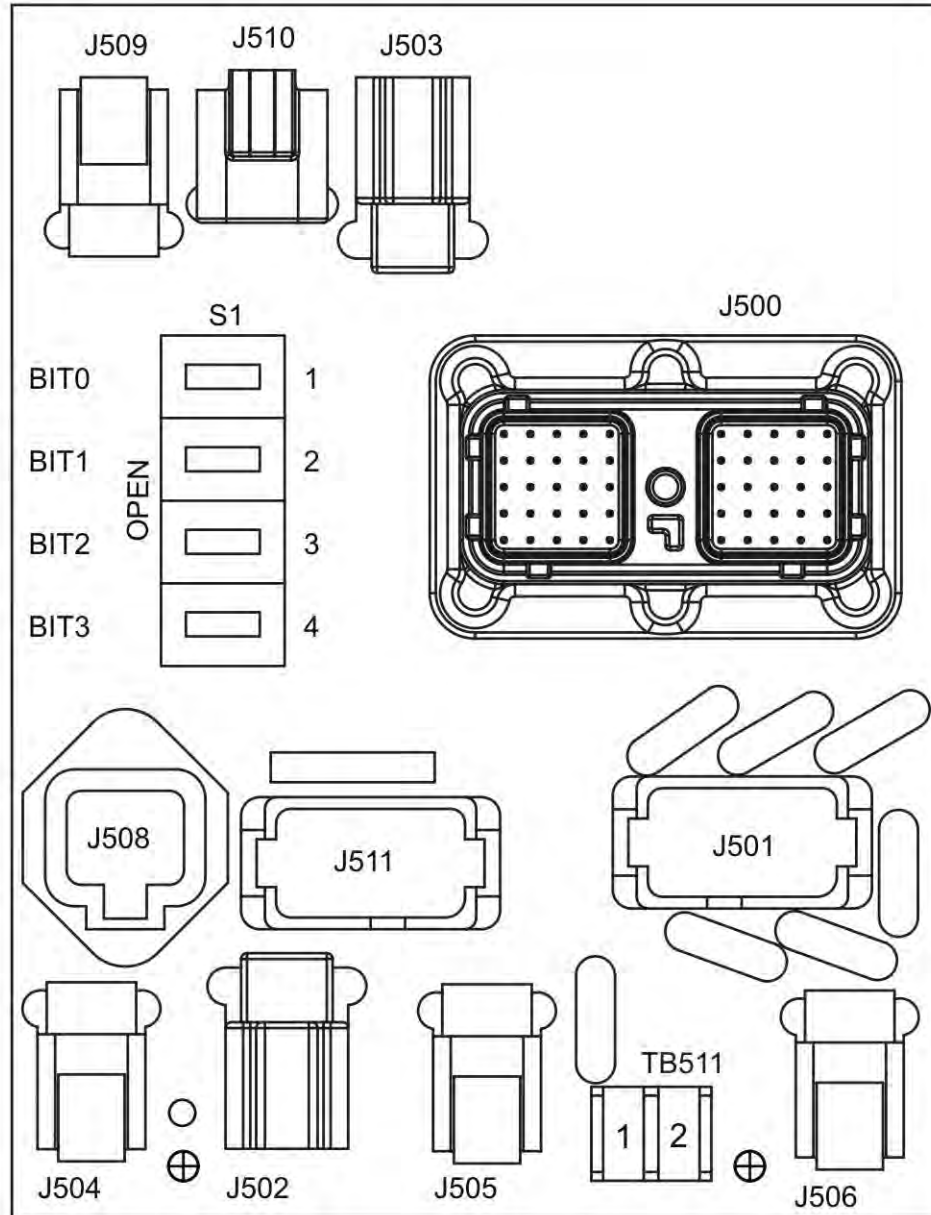
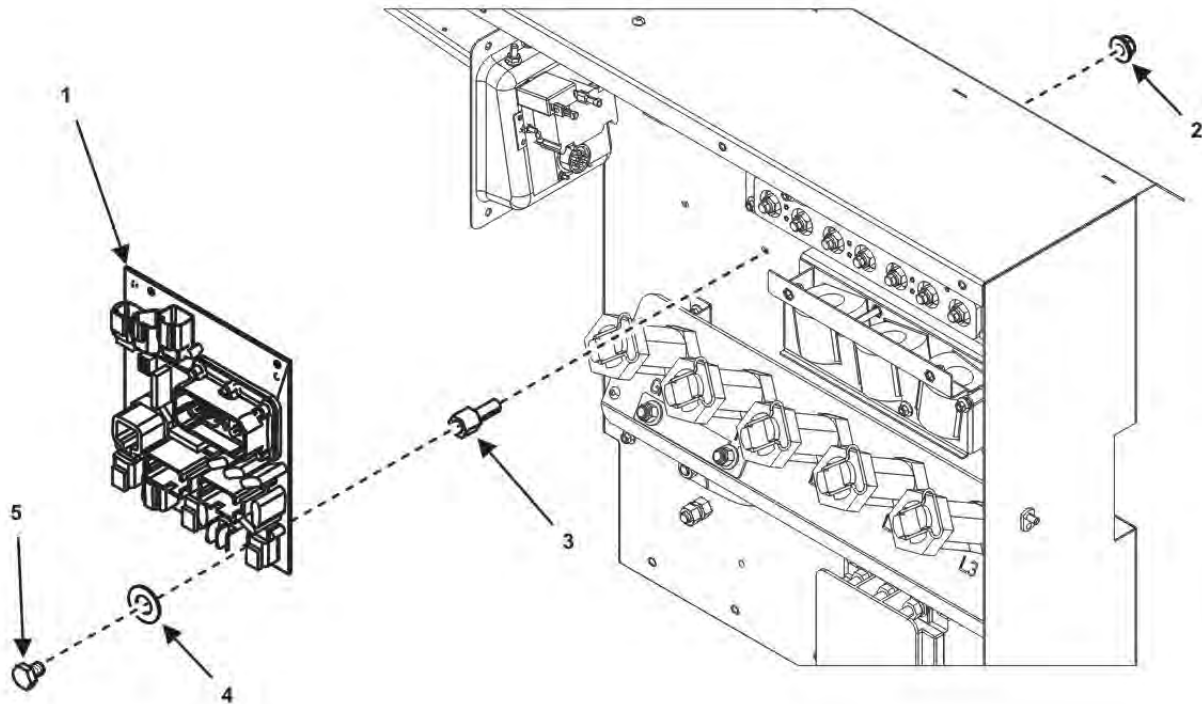


Figure 3. Printed Circuit Board Module Wiring Labels.

27. Tag electrical wire (Figure 2, Item 7) from printed circuit board module (Figure 2, Item 1) to ground strap bolt.
28. Remove screw (Figure 2, Item 9) and washer (Figure 2, Item 8) securing electrical wire (Figure 2, Item 7) to printed circuit board module (Figure 2, Item 1).
29. Remove electrical wire (Figure 2, Item 7) from printed circuit board module (Figure 2, Item 1).
30. Inspect electrical wire (Figure 2, Item 7) for frayed wire and other signs of obvious damage. Replace as required.



**Figure 4. Printed Circuit Board Module — Removal.**

31. Remove five nuts (Figure 4, Item 2) from back of output box that secure printed circuit board module (Figure 4, Item 1) to output box.
32. Remove printed circuit board module (Figure 4, Item 1) from output box and place on a suitable work surface.
33. Remove five screws (Figure 4, Item 5), five washers (Figure 4, Item 4), and five spacers (Figure 4, Item 3) from printed circuit board module (Figure 4, Item 1).
34. Note and record position of four dip switches (Figure 2, Item 15) on printed circuit board module (Figure 2, Item 1).

**END OF TASK**

## Inspect Printed Circuit Board Module

### CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

1. Inspect printed circuit board module (Figure 2, Item 1) for signs of obvious damage. Replace as required.
2. Inspect all mounting hardware for signs of obvious damage. Replace damaged hardware as required.

### END OF TASK

## Install Printed Circuit Board Module

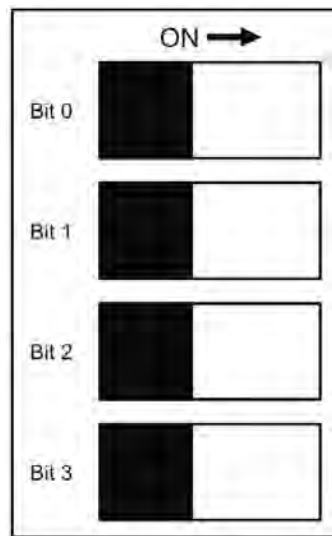


Figure 5. Dip Switch Settings.

### CAUTION

Printed circuit boards/cards contain components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit boards/cards. Failure to comply may cause damage to equipment.

### NOTE

Dip switch configurations should match Table 1. The dip switch is composed of four switches stacked vertically (Figure 5). The top switch is bit 0 and the bottom switch is bit 3 (Figure 5). In Table 1, 0 refers to the OFF position and 1 to the ON position. Figure 5 shows all switches in the OFF position.

Table 1. 30 kW Dip Switch Configuration.

GENSET HARDWARE CONFIGURATION	BIT 0	BIT 1	BIT 2	BIT 3
30 kW, 50/60 Hz	0	0	1	0
30 kW, 400 Hz	1	0	0	1

1. Configure four dip switches (Figure 2, Item 15) located on printed circuit board module (Figure 2, Item 1) using Table 1 and Figure 5 or notes taken during removal as a guide.
2. Install five flat washers (Figure 4, Item 4) and five screws (Figure 4, Item 5) to printed circuit board module (Figure 4, Item 1).
3. Install five spacers (Figure 4, Item 3) to threads of screws (Figure 4, Item 5).
4. Position printed circuit board module (Figure 4, Item 1) to mounting location on output box.
5. Install five nuts (Figure 4, Item 2) to five screws (Figure 4, Item 5) on rear side of output box. Tighten nuts (Figure 4, Item 2) to 25 – 31 in/lb (3 – 4 Nm).

### NOTE

Apply a thin coat of electrically conductive grease to all electrical connections prior to assembly.

Identification tags should remain in place until the output box is completely re-assembled and has been tested for proper operation.

6. Apply a thin coat of electrically conductive grease to all printed circuit board module electrical leads and harnesses.
7. Install top transformer wiring harness (Figure 2, Item 12) to printed circuit board module (Figure 2, Item 1) using identification tags installed during removal as a guide.
8. Install hour meter wiring harness (Figure 2, Item 3) to printed circuit board module (Figure 2, Item 1) using identification tags installed during removal as a guide.
9. Install voltage selection board wiring harness (Figure 2, Item 4) from voltage selection board to printed circuit board module (Figure 2, Item 1) using identification tags installed during removal as a guide.
10. Install DCS wiring harness (Figure 2, Item 14) from DCS to printed circuit board module (Figure 2, Item 1) using identification tags installed during removal as a guide.
11. Secure DCS wiring harness (Figure 2, Item 14) from DCS to printed circuit board module (Figure 2, Item 1) with screw (Figure 2, Item 13).
12. Install relay wiring harness (Figure 2, Item 12) to printed circuit board module (Figure 2, Item 1) using identification tags installed during removal as a guide.
13. Install N terminal and contactor wiring harness (Figure 2, Item 11) from N terminal and contactor to printed circuit board module (Figure 2, Item 1) using identification tags installed during removal as a guide.
14. Install wiring harnesses (Figure 2, Item 10) from terminals and contactor to printed circuit board module (Figure 2, Item 1) using identification tags installed during removal as a guide.
15. Install three transformers wiring harnesses (Figure 2, Item 5) from three transformers to printed circuit board module (Figure 2, Item 1) using identification tags installed during removal as a guide.
16. Install switch box contactor receptacle wiring harness (Figure 2, Item 6) from switch box contactor receptacle to printed circuit board module (Figure 2, Item 1) using identification tags installed during removal as a guide.
17. Position electrical wire (Figure 2, Item 7) from ground strap bolt to printed circuit board module (Figure 2, Item 1) using identification tags installed during removal as a guide.
18. Secure electrical wire (Figure 2, Item 7) from ground strap bolt to printed circuit board module (Figure 2, Item 1) with screw (Figure 2, Item 9) and washer (Figure 2, Item 8).
19. Position lower output box guard (not shown) and access door (not shown) over output box.
20. Install six screws (not shown) and securing lower output box guard (not shown) and access door (not shown) over output box.
21. Position upper output box guard (not shown) and access door (not shown) over output box.



- 
22. Install upper output box guard (not shown) over output box with four screws (not shown).
  23. Tighten screws (not shown) securing upper and lower output box guards (not shown) to 87 – 105 in/lb (10 – 12 Nm).
  24. Install right-side body panel (WP 0033, Remove/Install Right-Side Body Panel).
  25. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).

### **WARNING**

Exhaust discharge contains deadly gases, including carbon monoxide. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

26. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
27. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
28. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL HOUR METER**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0179, Table 2, Item 40)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Hour meter assembly (1) (WP 0124, Repair Parts List, Figure 19, Item 2)

Grease, electrically conductive (WP 0180, Expendable and Durable Items List, Item 22)

Tag, marker (WP 0180, Item 37)

**Personnel Required**

91D (1)

**References**

WP 0063, Remove/Install Printed Circuit Board Module

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Rear body panel removed (WP 0031, Remove/Install Rear Body Panel)

Right-side body panel removed (WP 0033, Remove/Install Right-Side Body Panel)

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**REMOVE/INSTALL HOUR METER****Remove Hour Meter**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove four screws (not shown) that secure upper output box guard (not shown) over output box.
3. Remove upper output box guard from output box.
4. Locate hour meter (Figure 1).

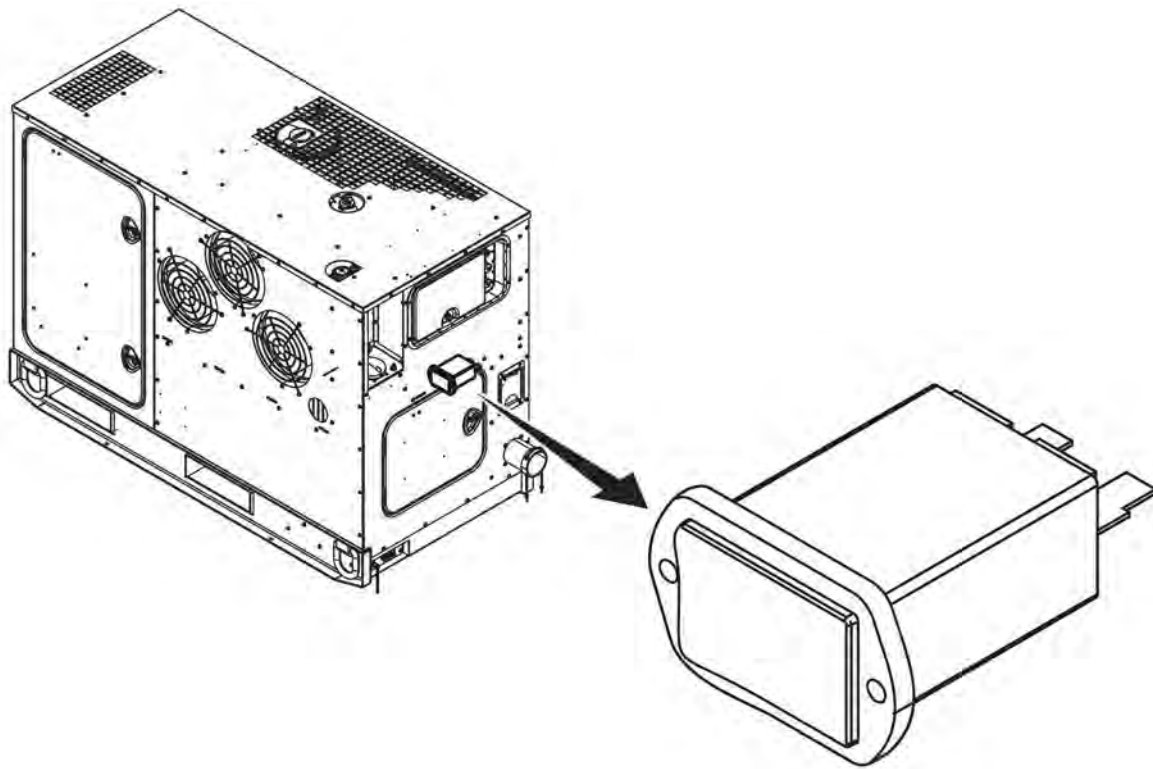


Figure 1. Hour Meter — Location.

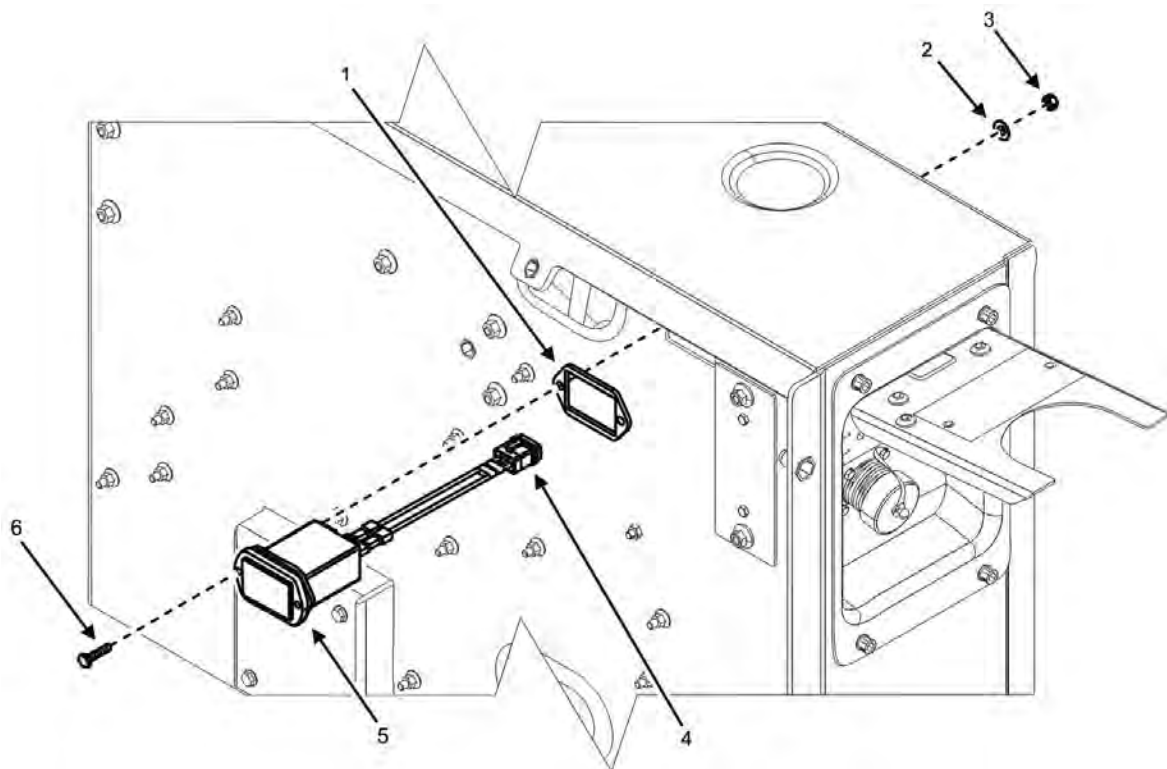


Figure 2. Hour Meter — Detail.

## CAUTION

Printed circuit board module (not shown) contains components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit board module. Failure to comply may cause damage to equipment.

## NOTE

Prior to disassembly, tag all electrical wires, cables, and connectors for identification. Tags will be used as a guide during installation

5. Tag and disconnect hour meter wiring harness (Figure 2, Item 4) from printed circuit board module of output box (WP 0063, Remove/Install Printed Circuit Board Module).

## NOTE

Hour meter wiring harness (Figure 2, Item 4) and mounting gasket (Figure 2, Item 1) are supplied with replacement hour meter assembly, or the hour meter (Figure 2, Item 5), mounting gasket (Figure 2, Item 1), and wiring harness (Figure 2, Item 4) can be replaced separately.

6. Remove two nuts (Figure 2, Item 3) and two washers (Figure 2, Item 2) from inside the output box and two screws (Figure 2, Item 6) from the rear of the output box that secure hour meter (Figure 2, Item 5) to back wall of output box.
7. Remove hour meter (Figure 2, Item 5), mounting gasket (Figure 2, Item 1), and hour meter wiring harness (Figure 2, Item 4) from output box. Discard mounting gasket (Figure 2, Item 1).

## END OF TASK

### Inspect Hour Meter

1. Inspect hour meter (Figure 2, Item 5) and hour meter wiring harness (Figure 2, Item 4) for signs of obvious damage. Replace as required.
2. Inspect all mounting hardware for signs of obvious damage. Replace as required.

## END OF TASK

### Install Hour Meter

1. Position hour meter (Figure 2, Item 5), new mounting gasket (Figure 2, Item 1), and hour meter wiring harness (Figure 2, Item 4) to mounting location in output box and align the mounting holes.
2. Secure hour meter (Figure 2, Item 5) to rear of output box with two screws (Figure 2, Item 6), two washers (Figure 2, Item 2), and two nuts (Figure 2, Item 3). Tighten to a value of 11 – 12 in/lb (1 Nm).

## CAUTION

Printed circuit board module contains components that are sensitive to static electricity. Always wear an antistatic wrist strap connected to a metal surface to channel static electricity to ground when handling printed circuit board module. Failure to comply may cause damage to equipment.

## NOTE

Identification tags should remain in place until the output box is completely re-assembled and has been tested for proper operation.

Apply a thin coat of electrically conductive grease to all electrical connections prior to assembly.

3. Apply a thin coat of electrically conductive grease to hour meter wiring harness (Figure 2, Item 4).
4. Install hour meter wiring harness (Figure 2, Item 4) to printed circuit board module (not shown) using identifications tags installed during removal as a guide (WP 0063, Remove/Install Printed Circuit Board Module).
5. Install upper output box guard (not shown) over output box with four screws (not shown).
6. Tighten upper output box guard screws (not shown) to 87 – 105 in/lb (10 – 12 Nm).
7. Install right-side body panel (WP 0033, Remove/Install Right-Side Body Panel).
8. Install rear body panel (WP 0031, Remove/Install Rear Body Panel).
9. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries)
10. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
11. Start engine and check for proper operation (TM 9-6115-752-10).
12. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL CIRCUIT BREAKER**

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**INITIAL SETUP****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB (WP 0179, Table 2, Item 40)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Breaker, circuit (WP 0123, Repair Parts List, Figure 18, Item 55)

Grease, electrically conductive (WP 0180, Expendable and Durable Items List, Item 22)

**Personnel Required**

91D (1)

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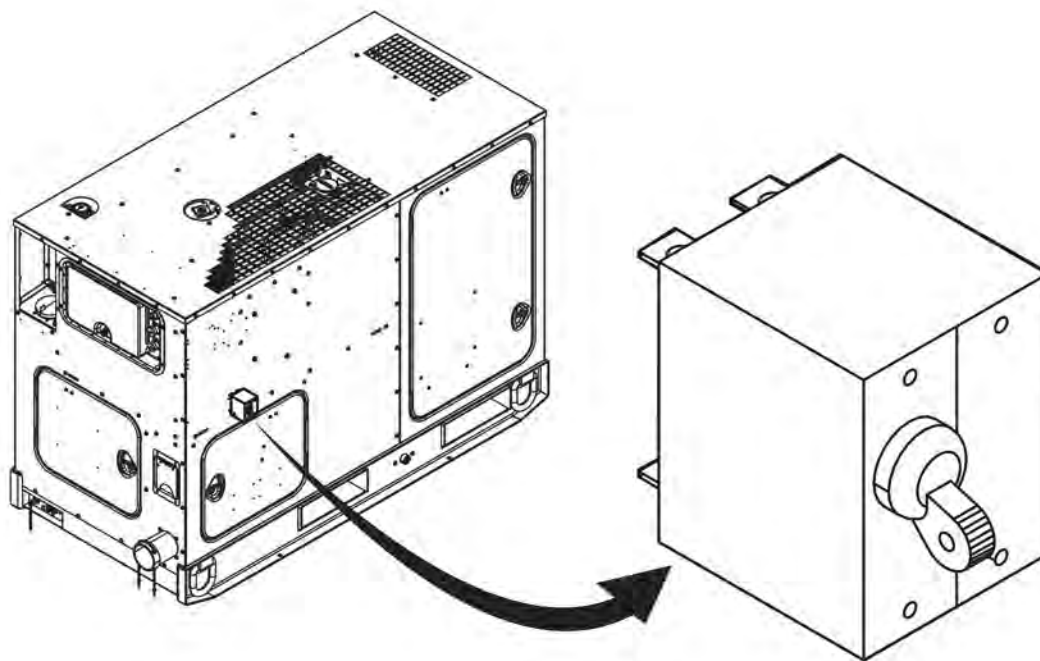
**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Right-side body panel removed (WP 0033, Remove/Install Right-Side Body Panel)

**REMOVE/INSTALL CIRCUIT BREAKER****Remove Circuit Breaker**

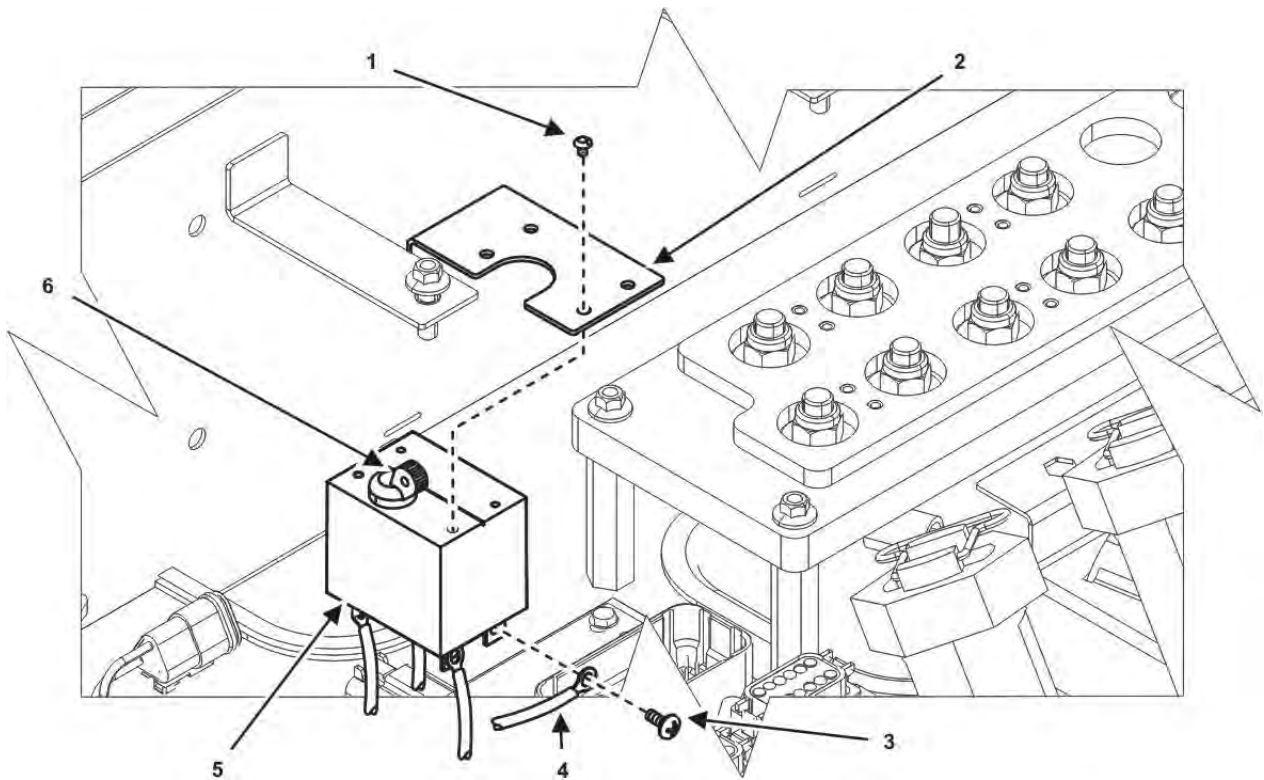
**Figure 1. Circuit Breaker — Location.**

**NOTE**

30 kW 400 Hz circuit breaker is only found on UOC 98M.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove four screws (not shown) that secure upper output box guard (not shown) over output box.
3. Remove upper output box guard from output box.
4. Locate circuit breaker (Figure 1) mounted in output box.





**Figure 2. Circuit Breaker — Removal.**

5. Remove four screws (Figure 2, Item 1) securing circuit breaker (Figure 2, Item 5) to mounting panel (Figure 2, Item 2) in output box.
6. Reposition circuit breaker (Figure 2, Item 5) to gain access to wiring harnesses (Figure 2, Item 4) attached to the rear of circuit breaker (Figure 2, Item 5).
7. Tag wiring harnesses (Figure 2, Item 4) from rear of circuit breaker (Figure 2, Item 5).
8. Remove screw (Figure 2, Item 3) and wiring harnesses (Figure 2, Item 4) from rear of circuit breaker (Figure 2, Item 5).
9. Remove circuit breaker (Figure 2, Item 5) from output box.

#### **END OF TASK**

#### **Inspect Circuit Breaker**

1. Inspect circuit breaker (Figure 2, Item 5) for obvious signs of damage and replace as required.
2. Inspect wiring harnesses (Figure 2, Item 4) for frayed wires and other obvious signs of damage and replace as required.

#### **END OF TASK**

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**Install Circuit Breaker****NOTE**

30 kW 400 Hz circuit breaker is only found on UOC 98M.

Identification tags should remain in place until the output box is completely re-assembled and has been tested for proper operation.

Apply a thin coat of electrically conductive grease to all wiring harnesses prior to assembly.

1. Ensure circuit breaker switch (Figure 2, Item 6) is in OFF position.
2. Place appropriately tagged wiring harnesses (Figure 2, Item 4) to proper locations on circuit breaker (Figure 2, Item 5).
3. Install wiring harnesses (Figure 2, Item 4) with screws (Figure 2, Item 3).
4. Position circuit breaker (Figure 2, Item 5) to mounting panel (Figure 2, Item 2) on output box.
5. Secure circuit breaker (Figure 2, Item 5) to mounting panel (Figure 2, Item 2) with four screws (Figure 2, Item 1).
6. Tighten screws (Figure 2, Item 1) to 9 – 18 in/lb (1 – 2 Nm).
7. Install upper output box guard (not shown) over output box with four screws (not shown).
8. Tighten upper output box guard (not shown) screws (not shown) to 87 – 105 in/lb (10 – 12 Nm).
9. Close generator set doors.
10. Install right-side body panel (WP 0033, Remove/Install Right-Side Body Panel).
11. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
12. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
13. Start engine and check for proper operation (TM 9-6115-752-10).
14. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL 50/60 HZ ENGINE ASSEMBLY**

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**INITIAL SETUP:****Test Equipment**

Load Bank (WP 0179, Table 2, Item 2)  
**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 FT-LB (WP 0179, Table 2, Item 38)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0179, Table 2, Item 39)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Engine assembly (WP 0135, Repair Parts List, Figure 30, Item 1)

Isolator, vibration (2) (WP 0128, Repair Parts List, Figure 23, Item 11)

Antifreeze, ethylene glycol (WP 0180, Expendable and Durable Items List, Item 2)

Cap set, protective (WP 0180, Item 8)

Compound, antiseize (WP 0180, Item 14)

Distilled water (WP 0180, Item 19)

Fuel, diesel (WP 0180, Item 21)

Grease, electrically conductive (WP 0180, Item 22)

Lubricating oil, engine (WP 0180, Item 25)

Pan, drain (WP 0180, Item 30)

Penetrating oil (WP 0180, Item 31)

Rag, wiping (WP 0180, Item 33)

Sealant (WP 0180, Item 34)

Soap, ivory (WP 0180, Item 35)

Tag, marker (WP 0180, Item 37)

**Personnel Required**

91D (1)

Assistant (2)

**References**

WP 0039, Remove/Install Engine Wiring Harness

WP 0087, Remove/Install ECM Wiring Harness

WP 0100, General Maintenance

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Batteries disconnected (WP 0037, Remove/Install Batteries)

Engine oil drained (WP 0068, Service Lubrication System)

Coolant drained (WP 0022, Service Cooling System)

Top body panel removed (WP 0029, Remove/Install Top Body Panel)

Left-side door frame removed (WP 0032, Remove/Install Left-Side Body Panel)

Right-side door frame removed (WP 0033, Remove/Install Right-Side Body Panel)

Front body panel removed (WP 0030, Remove/Install Front Body Panel)

Air intake hoses removed from engine (WP 0019, Remove/Install Air Intake Hose Assemblies)

Fuel inlet line removed from spin-on fuel filter (WP 0072, Remove/Install Spin-On Fuel Filter Assembly)

Exhaust pipe removed from engine and muffler (WP 0084, Remove/Install Muffler)

Cooling hoses and tubes removed from engine and radiator (WP 0025, Remove/Install Radiator Hose and Tube Assemblies)

Intake air heater relay removed (WP 0042, Remove/Install Intake Air Heater Relay)

ECM removed from unit bulkhead and set aside for shipment with engine (WP 0081, Remove/Install Engine ECM)

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**INITIAL SETUP — CONTINUED:****Equipment Conditions**

Wiring removed from battery-charging alternator (WP 0079, Remove/Install Battery-Charging Alternator Assembly)

Wiring removed from starter (WP 0078, Remove/Install Starter)

---

**REMOVE/INSTALL ENGINE ASSEMBLY****WARNING**

- Engine assembly weighs approximately 818 lb (371 kg). Use suitable lifting device with the capacity to lift the weight of the engine assembly. Failure to comply may cause injury or death to personnel.
- Comply with all lifting requirements. Observe the decals on equipment and parts that identify the weight and determine if assistance is needed. Maximum lift is 37 lb (16.8 kg) for one person, 74 lb (33.6 kg) for two persons, and 101 lb (45.8 kg) for three persons. Failure to comply may cause injury or death to personnel.

**Remove Engine Assembly****NOTE**

Cap/plug all open fuel hoses/fittings and cooling ports and hoses to prevent dirt and debris from entering the engine.

Tag all electrical wires and connectors prior to removal to aid installation. Remove tags from wires and connectors at installation.

All parts removed or disconnected from the engine assembly are intended for reuse at time of reassembly unless they are damaged and must be replaced.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate engine on generator set skid (Figure 1).

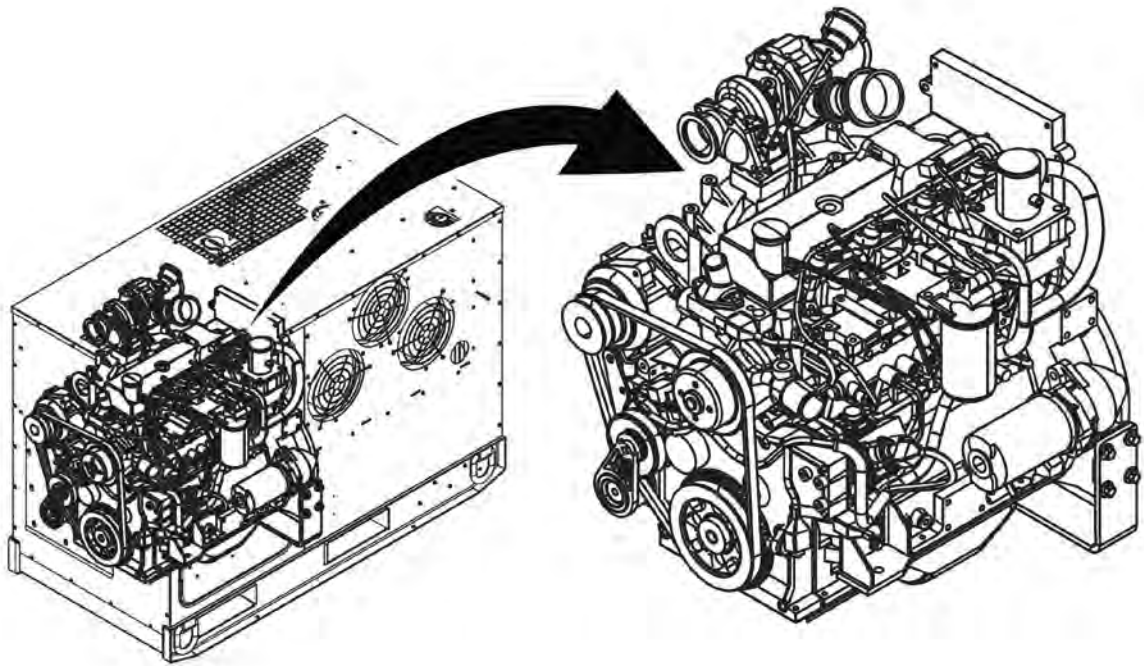


Figure 1. Engine Assembly — Location.

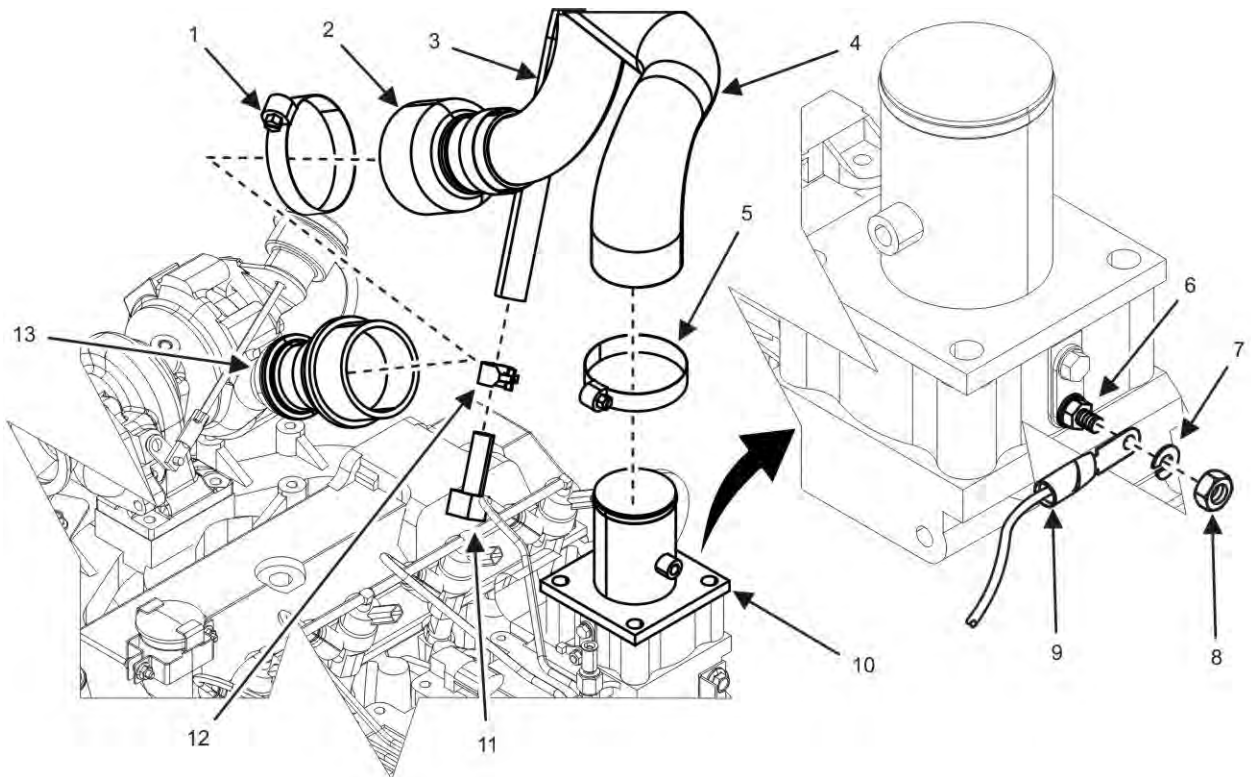
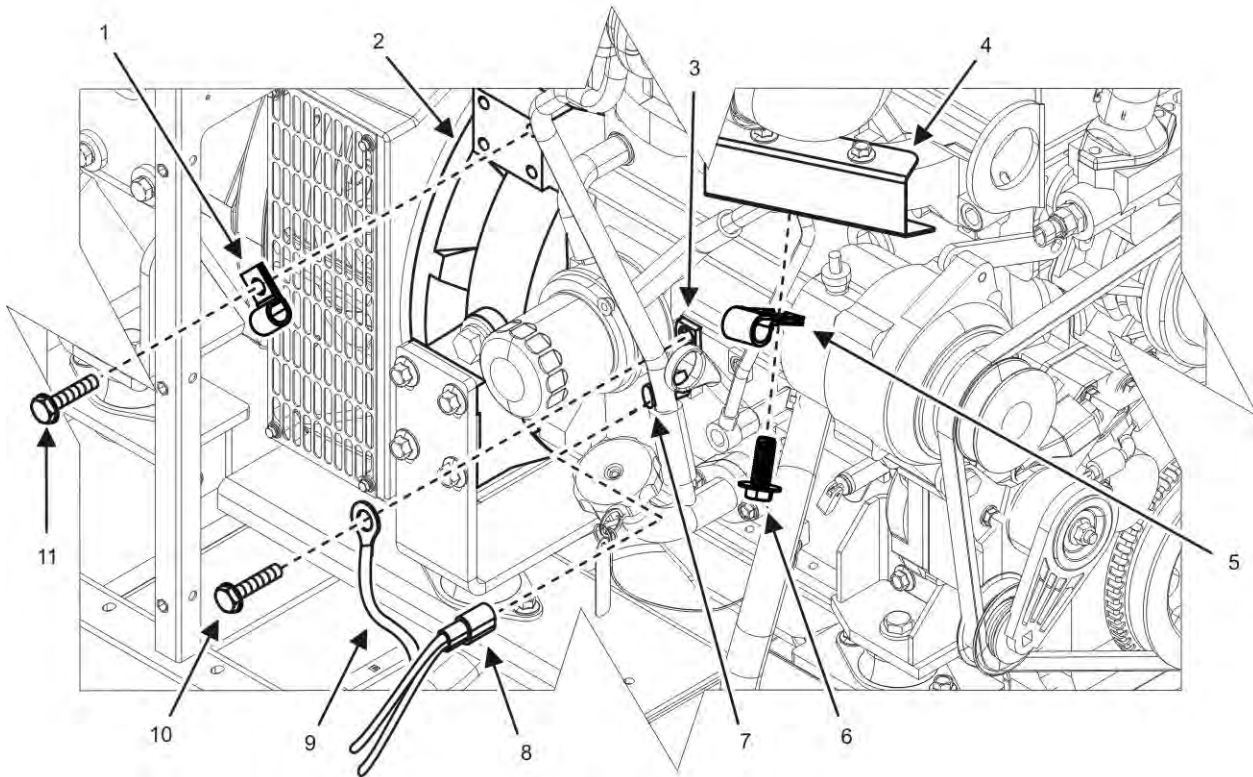


Figure 2. Electrical Connections and Hoses — Top of Engine.

3. Remove nut (Figure 2, Item 8) and lock washer (Figure 2, Item 7) that secure wire (Figure 2, Item 9) to terminal on intake air heater (Figure 2, Item 6). Discard lock washer (Figure 2, Item 7).
4. Remove wire (Figure 2, Item 9) from terminal on intake air heater (Figure 2, Item 6).
5. Reposition wire (Figure 2, Item 9) and secure with wire ties to prevent damage during removal or installation.
6. Reposition hose clamps (Figure 2, Items 1 and 5) on charge air cooler hoses (Figure 2, Items 2 and 4) at intake manifold (Figure 2, Item 10) and turbocharger (Figure 2, Item 13).
7. Remove charge air cooler hoses (Figure 2, Items 2 and 4) from intake manifold (Figure 2, Item 10) and turbocharger (Figure 2, Item 13).
8. Reposition hoses (Figure 2, Items 2 and 4) and secure with wire ties to prevent damage during removal or installation.
9. Reposition hose clip (Figure 2, Item 12) on coalescer hose (Figure 2, Item 3) attached to valve cover (Figure 2, Item 11).
10. Remove coalescer hose (Figure 2, Item 3) from valve cover (Figure 2, Item 11).
11. Reposition hose (Figure 2, Item 3) and secure with wire tie to prevent damage during removal or installation.



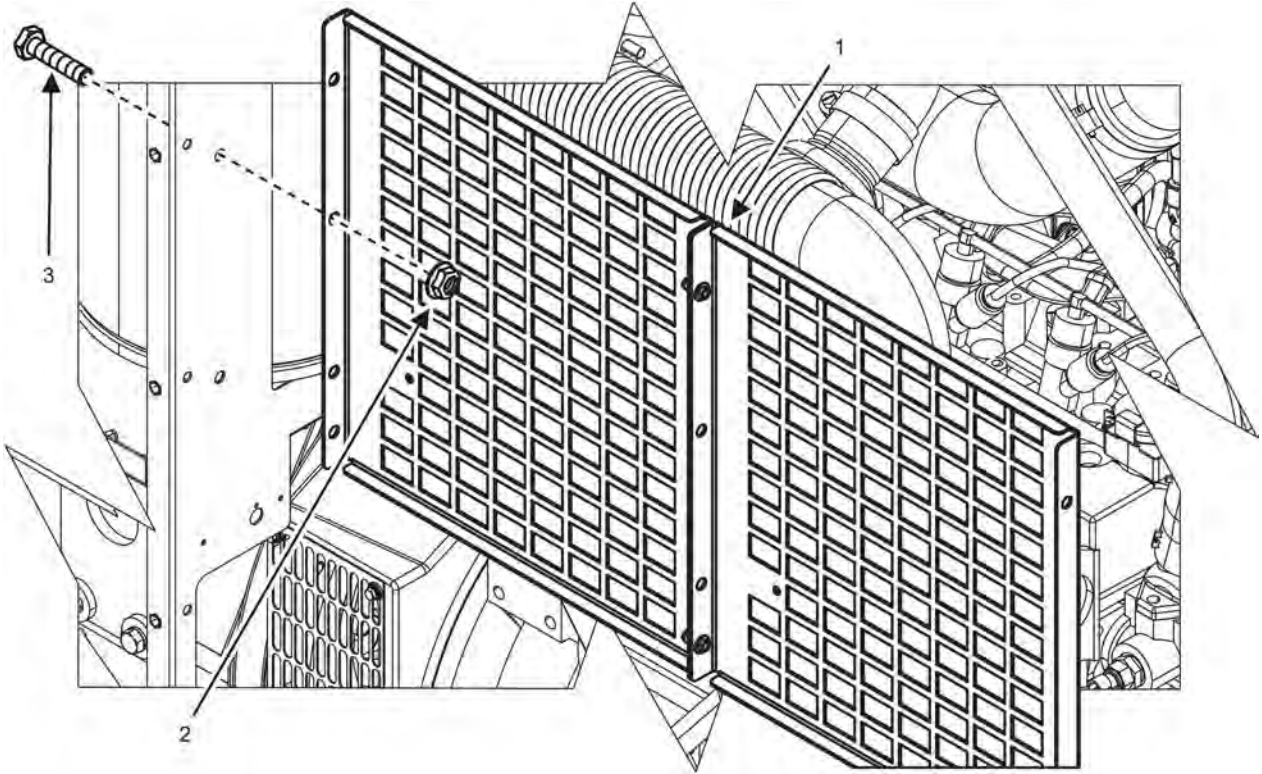
**Figure 3. P-Clamp — Removal.**

### NOTE

Engine wiring harnesses and hoses are secured to unit in several places by P-clamps. P-clamps must be removed to remove hoses and wiring and reposition hoses and wiring harnesses to allow engine removal.

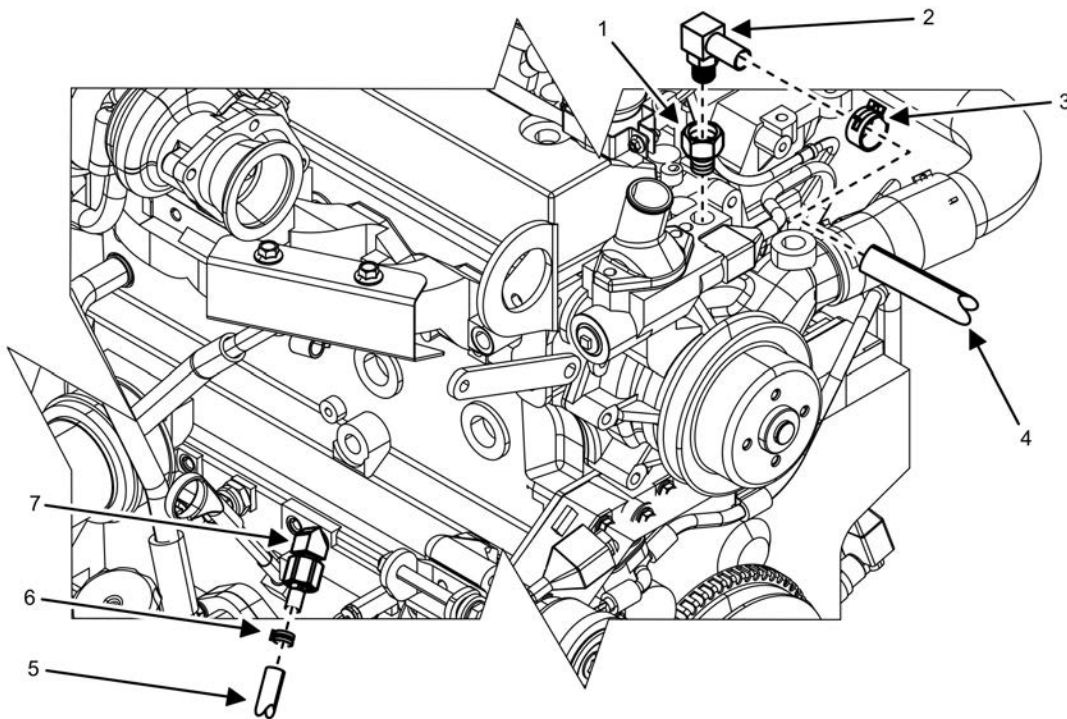
12. Remove screws (Figure 3, Items 6 and 11) that secure P-clamps (Figure 3, Items 1 and 5) to flywheel housing (Figure 3, Item 2) and exhaust manifold heat shield (Figure 3, Item 4).

13. Remove screw (Figure 3, Item 10) securing wiring harness ground wire (Figure 3, Item 9) to engine block (Figure 3, Item 3).
14. Remove wiring harness ground wire (Figure 3, Item 9) from engine block (Figure 3, Item 3).
15. Remove electrical connector (Figure 3, Item 8) from oil pressure sender (Figure 3, Item 7).
16. Reposition wiring harness electrical connector (Figure 3, Item 8) and ground wire (Figure 3, Item 9) and secure with wire ties to prevent damage during removal or installation.



**Figure 4. Heat Shield — Removal.**

17. Remove two nuts (Figure 4, Item 2) from two bolts (Figure 4, Item 3) securing heat shields (Figure 4, Item 1) to unit bulkhead without removing bolts (Figure 4, Item 3).
18. Remove heat shields (Figure 4, Item 1) from bolts (Figure 4, Item 3) on unit bulkhead.



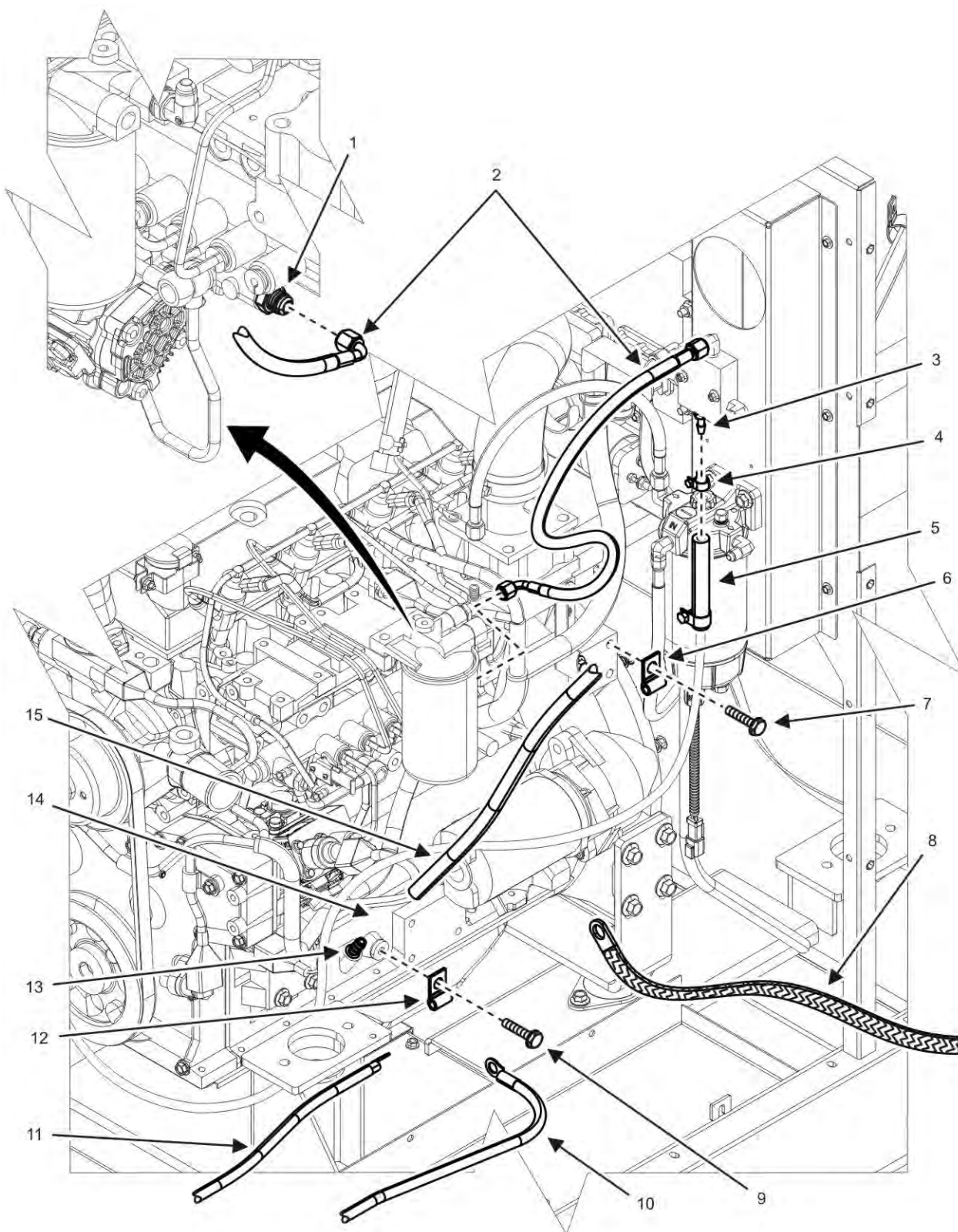
**Figure 5. Engine Hoses and Wires — Right-Side.**

### **NOTE**

Steps 19 through 23 are only required if the optional winterization kit has been installed.

19. Reposition hose clip (Figure 5, Item 6) on winterization kit hose (Figure 5, Item 5) located on barb (Figure 5, Item 7) at right-side of engine.
20. Remove winterization kit hose (Figure 5, Item 5) from barb (Figure 5, Item 7).
21. Reposition hose clip (Figure 5, Item 3) on winterization kit hose (Figure 5, Item 4) and elbow (Figure 5, Item 2).
22. Remove winterization kit hose (Figure 5, Item 4) from elbow (Figure 5, Item 2).
23. Remove elbow (Figure 5, Item 2) and adaptor pipe (Figure 5, Item 1) from engine.





**Figure 6. Engine Hoses, Wires, and P-Clamps — Left-Side.**

24. Remove fuel return line (Figure 6, Item 2) from fitting (Figure 6, Item 1).

- 
25. Reposition hose clip (Figure 6, Item 14) at coalescer drain hose (Figure 6, Item 15) on engine (Figure 6, Item 13).
  26. Remove coalescer drain hose (Figure 6, Item 15) from engine (Figure 6, Item 13).

### NOTE

Steps 27 through 30 are only required if the optional winterization kit has been installed.

27. Remove two bolts (Figure 6, Items 7 and 9) and two P-clamps (Figure 6, Items 6 and 12) securing winterization kit fuel hose (Figure 6, Item 5) to engine.
28. Loosen hose clamp (Figure 6, Item 4) and slide back on winterization kit fuel hose (Figure 6, Item 5).
29. Remove winterization kit fuel hose (Figure 6, Item 5) from fuel manifold (Figure 6, Item 3).
30. Secure winterization kit fuel hose (Figure 6, Item 5) with wire ties to prevent damage during removal and installation of engine.
31. Remove ground strap (Figure 6, Item 8) from engine if not removed with starter wires (Figure 6, Items 10 and 11) (WP 0078, Remove/Install Starter).
32. Secure ground strap (Figure 6, Item 8) and starter wires (Figure 6, Items 10 and 11) with wire ties to prevent damage during removal and installation of engine.

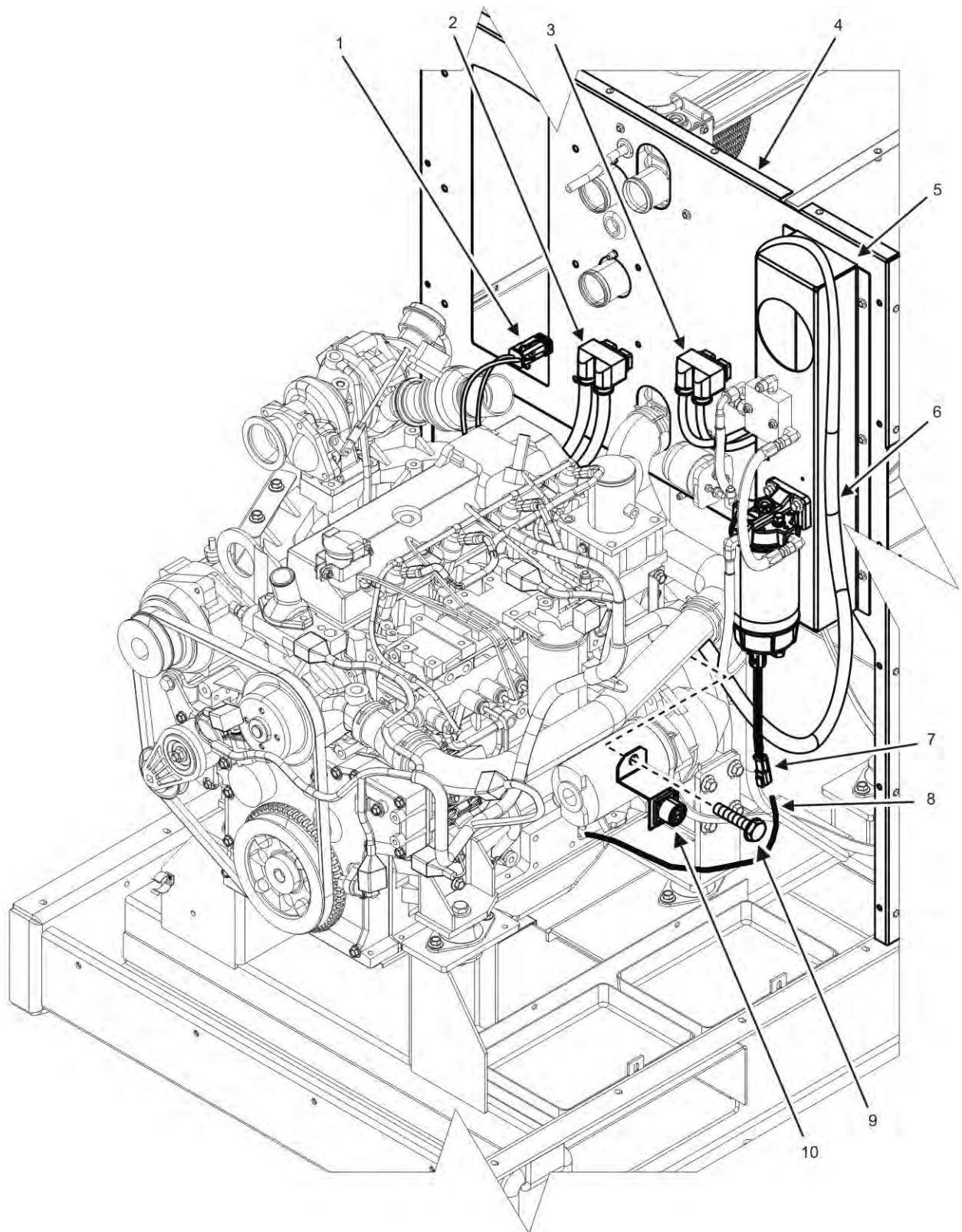


Figure 7. ECM and ECM Wiring Harness — Removal.

### CAUTION

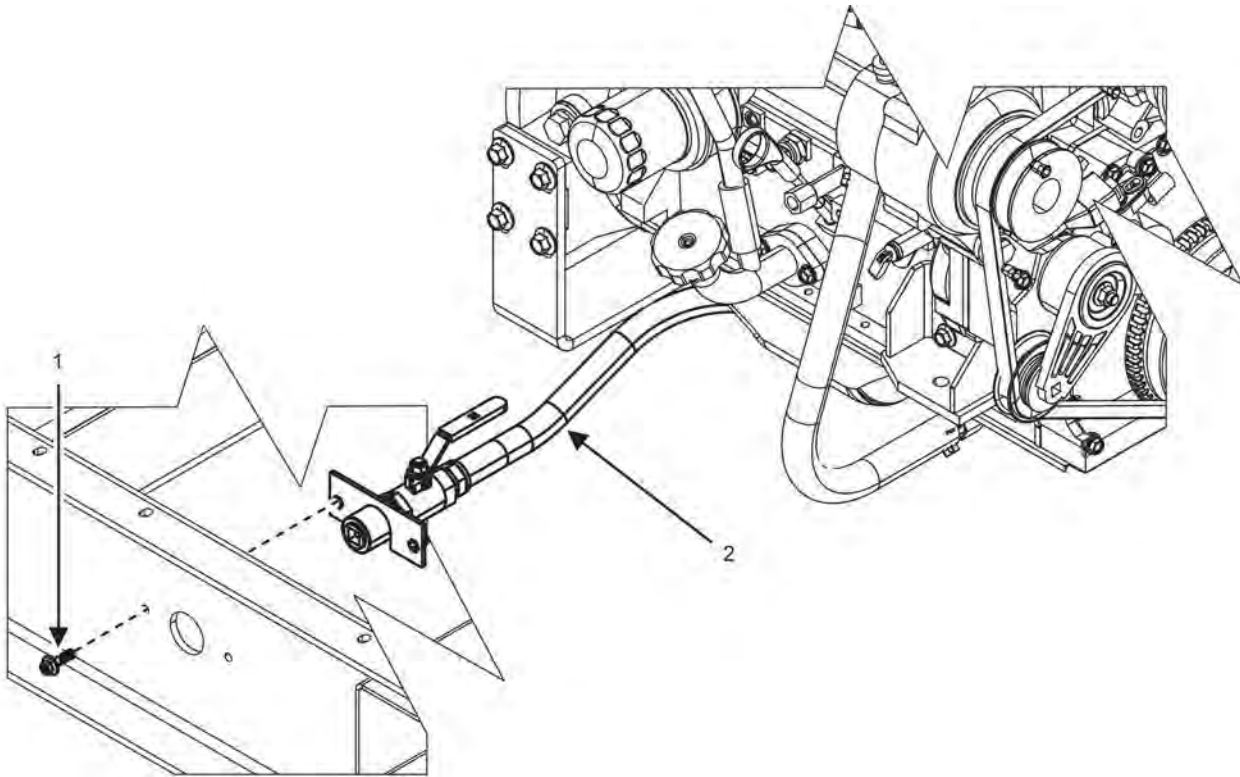
Loose wiring can easily be damaged during engine removal. Move remaining wiring to the outside perimeter of the unit skid, away from the engine assembly. Failure to comply may cause damage to equipment.

33. Remove bolt (Figure 7, Item 9) that secures ECM diagnostic port (Figure 7, Item 10) to engine.
34. Remove ECM diagnostic port (Figure 7, Item 10) from engine.
35. Secure power electrical connector (Figure 7, Item 1), engine wiring harness multipin connector (Figure 7, Item 2), and ECM diagnostic port (Figure 7, Item 10) to unit bulkhead (Figure 7, Item 4) or generator set with wire ties to prevent damage during removal.

### CAUTION

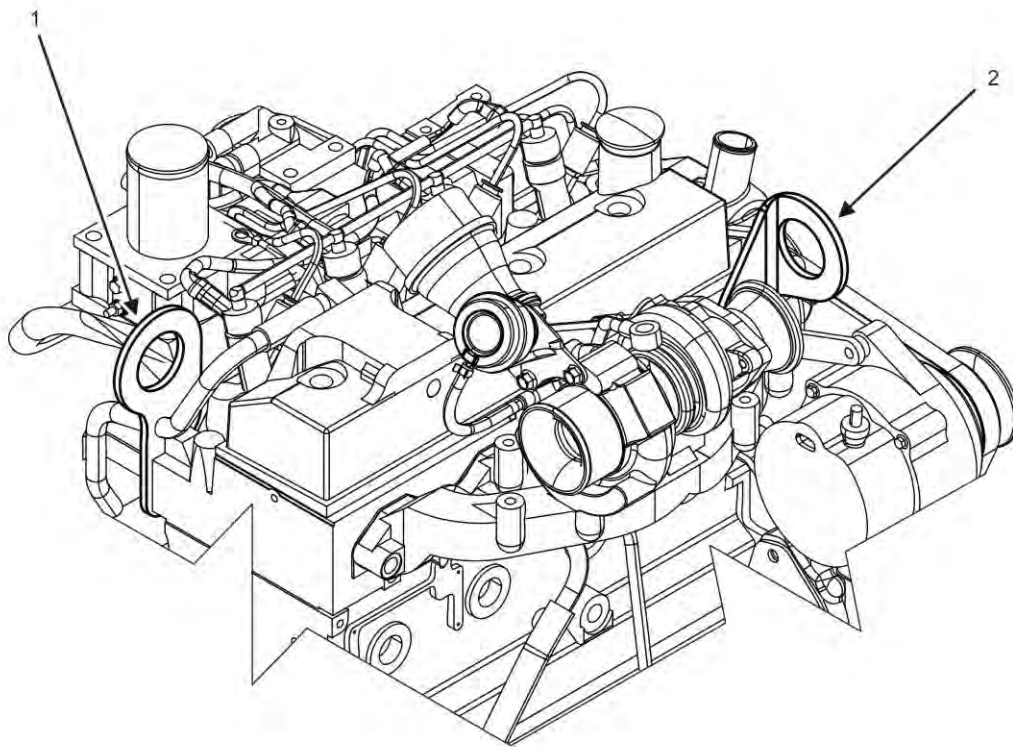
Ensure ECM wiring harness (Figure 7, Item 3) is not damaged while removing from unit and attaching to engine. Failure to comply will cause damage to equipment.

36. Reroute ECM engine wiring harness (Figure 7, Item 3) and wire (Figure 7, Item 6) to remove from air duct (Figure 7, Item 5) and place on engine.
37. Secure ECM engine wiring harness (Figure 7, Item 3) and wire (Figure 7, Item 6) to engine with wire ties to prevent damage during removal.
38. Disconnect water in fuel sensor connector (Figure 7, Item 7) from wiring harness (Figure 7, Item 8).
39. Secure wiring harness (Figure 7, Item 8) to unit skid with wire ties to prevent damage during removal of engine.



**Figure 8. Engine Oil Drain Hose Assembly.**

40. Remove two screws (Figure 8, Item 1) that secure engine oil drain hose assembly (Figure 8, Item 2) to unit skid.



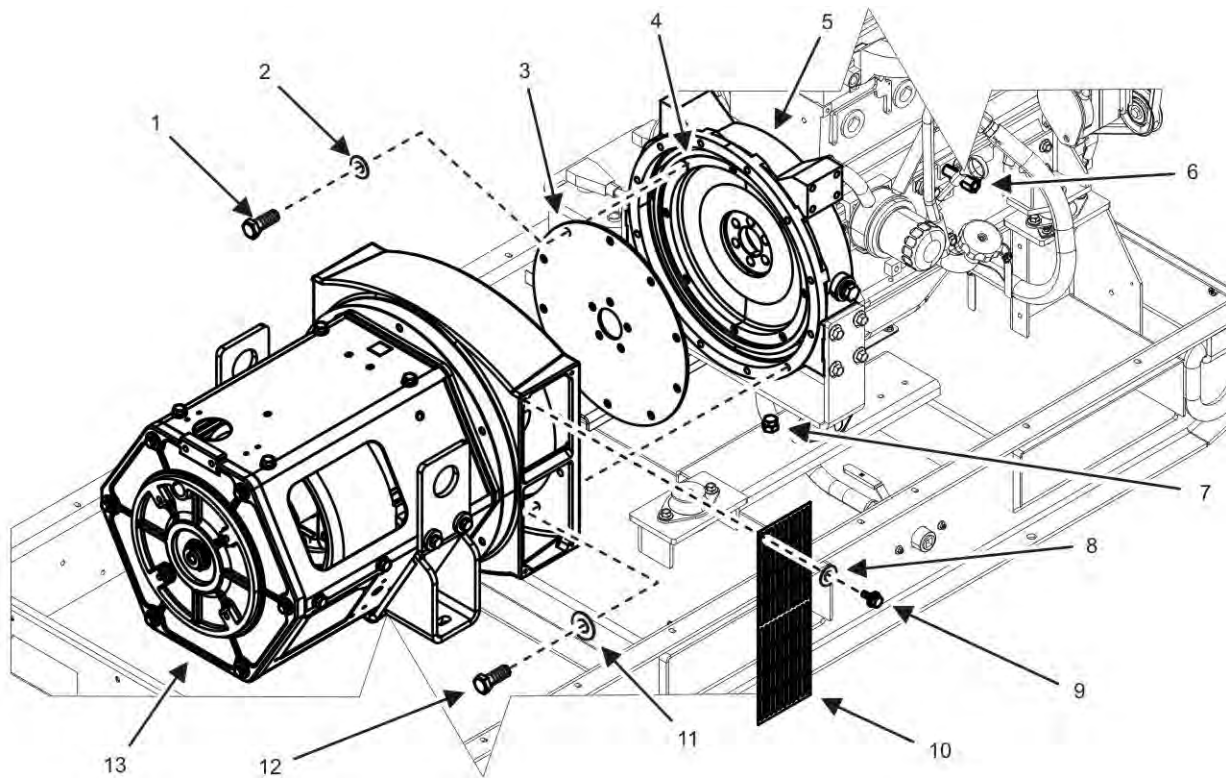
**Figure 9. Lifting Eyes.**

41. Remove engine oil drain hose assembly (Figure 8, Item 2) from unit skid.
42. Inspect lifting eyes (Figure 9, Items 1 and 2) for damage and missing or loose attaching hardware (not shown).
43. Replace damaged lifting eyes (Figure 9, Items 1 and 2) and missing hardware (not shown) as required.
44. Tighten loose lifting eye hardware (not shown) to 35 – 38 ft/lb (47 – 51 Nm) as required.
45. Attach suitable lifting device to lifting eyes (Figure 9, Items 1 and 2) of engine.

**NOTE**

Chains on lifting device should be taut with no slack.

46. Raise lifting device to remove slack in lifting device.



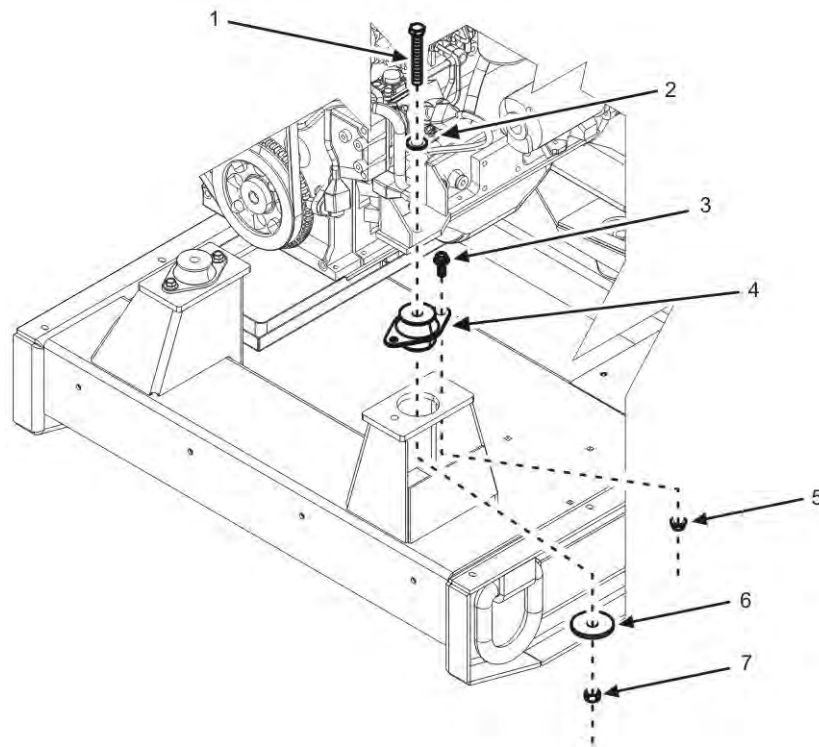
**Figure 10. Detach Engine from AC Generator.**

47. Remove four screws (Figure 10, Item 9) and four washers (Figure 10, Item 8) securing screen (Figure 10, Item 10) over AC generator (Figure 10, Item 13).
48. Remove screen (Figure 10, Item 10) from AC generator (Figure 10, Item 13).
49. Repeat steps 47 and 48 for other side of AC generator (Figure 10, Item 13).

### CAUTION

AC generator must be secured in place during engine removal. Failure to comply will cause damage to equipment.

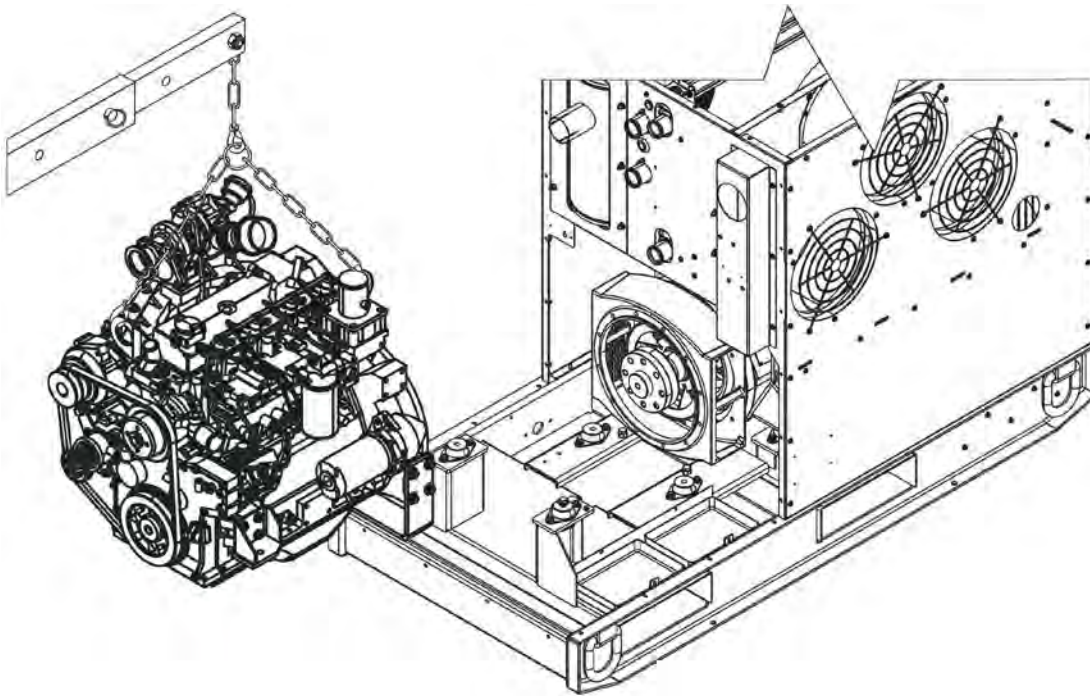
50. Turn jack screws (Figure 10, Item 7) clockwise until they contact AC generator (Figure 10, Item 13).
51. Remove 12 screws (Figure 10, Item 12) and flat washers (Figure 10, Item 11) securing flywheel housing (Figure 10, Item 5) to AC generator (Figure 10, Item 13).
52. Remove eight screws (Figure 10, Item 1) and eight flat washers (Figure 10, Item 2) that secure flywheel (Figure 10, Item 4) to AC generator drive plate (Figure 10, Item 3), turning harmonic balancer hex cap screw (not shown) using socket and breaker bar as required to access screws (Figure 10, Item 1).



**Figure 11. Engine Mounting Bolts — Removal.**

53. Remove engine mounting bolt (Figure 11, Item 1), flat washer (Figure 11, Item 2), snubbing washer (Figure 11, Item 6), and nut (Figure 11, Item 7) securing engine to left-side vibration isolator (Figure 11, Item 4).
54. Remove two bolts (Figure 11, Item 3) and two nuts (Figure 11, Item 5) that secure vibration isolator (Figure 11, Item 4) to unit skid.
55. Remove and discard vibration isolator (Figure 11, Item 4) from unit skid.
56. Repeat steps 53 through 55 for right-side vibration isolator (Figure 11, Item 4).





**Figure 12. Engine — Removal.**

### **WARNING**

When lifting engine, use lifting equipment with minimum lifting capacity of 1000 lb (453.6 kg). Do not stand or put arms, legs, or any body part under hoisted load. Do not permit generator set to swing. Failure to comply may cause injury or death to personnel.

57. Lift engine (Figure 10, Item 6) slowly until just free of engine mounts using suitable lifting device (Figure 12).

### **NOTE**

If AC generator drive plate (Figure 10, Item 3) remains attached to flywheel (Figure 10, Item 4), perform steps 58 through 60 to separate flywheel (Figure 10, Item 4) and AC generator drive plate (Figure 10, Item 3).

58. Saturate area where flywheel (Figure 10, Item 4) and AC generator drive plate (Figure 10, Item 3) are connected with penetrating oil.
59. Allow penetrating oil to soak for 1 hr.
60. Strike point of contact between flywheel (Figure 10, Item 4) and AC generator drive plate (Figure 10, Item 3) using a hammer and brass drift around circumference of flywheel (Figure 10, Item 4) until the two components break free.
61. Move engine (Figure 10, Item 6) horizontally away from AC generator (Figure 10, Item 13) carefully to separate flywheel (Figure 10, Item 4) from AC generator drive plate (Figure 10, Item 3).

### **CAUTION**

Do not permit AC generator rotor to remain attached to flywheel. Failure to comply will cause damage to equipment.

62. Remove engine from unit (Figure 12).



63. Secure engine to engine stand or other suitable work surface.
64. Remove lifting device from engine.

### CAUTION

Engine ECM must be shipped with engine for proper overhaul, troubleshooting, and analysis. Ensure ECM is attached away from hot or moving parts. Failure to comply may cause damage to equipment.

65. Attach engine ECM (removed as part of equipment conditions, not shown) to engine ECM wiring harness (Figure 7, Item 3) and secure to engine (Figure 10, Item 6) with wiring ties.

### END OF TASK

#### Inspect Engine Assembly

1. Inspect engine (Figure 10, Item 6) for signs of obvious damage to components.
2. Replace damaged components as required.
3. Inspect screws and washers (Figure 10, Items 1, 2, 8, 9, 11, and 12) for damage, deterioration, or wear and replace as required.
4. Inspect mounting location on unit skid for damage, corrosion, or cracks. Replace unit skid as required.
5. Inspect oil drain hose assembly (Figure 8, Item 2) and fuel return line (Figure 6, Item 2) for damage. Replace as required.
6. Inspect winterization kit hoses (if installed) (Figure 5, Items 4 and 5) and winterization kit fuel hose (Figure 6, Item 5) for signs of obvious damage. Replace damaged components as required.
7. Inspect coalescer hoses (Figure 6, Item 15 and Figure 2, Item 3) for signs of obvious damage. Replace as required.
8. Inspect charge air cooler hoses (Figure 2, Items 2 and 4) for signs of obvious damage. Replace as required.
9. Inspect ground strap (Figure 6, Item 8) for signs of fraying or obvious damage. Replace as required.
10. Inspect ECM engine harness plug (Figure 7, Item 3) at the ECM and inspect ECM (not shown) for damage. Replace as required (WP 0081, Remove/Install Engine ECM and WP 0087, Remove/Install ECM Wiring Harness).
11. Inspect electrical connectors on wires (Figure 2, Item 9; Figure 3, Items 8 and 9; and Figure 7, Items 1, 2, 7, and 8) for signs of obvious damage.
12. Repair or replace damaged electrical connectors (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).
13. Inspect AC generator screens (Figure 10, Item 10) for damage. Replace as required.

### END OF TASK

#### Install Engine Assembly

1. Position two new vibration isolators (Figure 11, Item 4) to mounting locations on unit skid and secure to each location by installing two bolts (Figure 11, Item 3) and two nuts (Figure 11, Item 5) finger-tight.
2. Tighten vibration isolator mounting nuts (Figure 11, Item 3) to 35 – 42 ft/lb (48 – 57 Nm).
3. Inspect lifting eyes (Figure 9, Items 1 and 2) for damage and missing or loose attaching hardware.
4. Replace damaged lifting eyes (Figure 9, Items 1 and 2) and missing hardware as required.
5. Tighten loose lifting eye hardware to 35 – 38 ft/lb (47 – 51 Nm) as required.

6. Attach suitable lifting device to lifting eyes (Figure 9, Items 1 and 2) of engine.
7. Raise engine assembly using lifting device.
8. Position engine to its approximate mounting location in unit skid.

### CAUTION

Use caution when lowering the engine assembly not to kink the engine oil drain line. As engine assembly is lowered, position engine oil drain line toward left-side of unit skid. Failure to comply may cause damage to equipment.

Loose wiring can easily be damaged during engine installation. Move remaining wiring to the outside perimeter of the unit skid, away from the engine assembly. Failure to comply may cause damage to equipment.

9. Position engine mounting bolts (Figure 11, Item 1) upside down in bottom of vibration isolators (Figure 11, Item 4) to assist with alignment.
10. Lower engine (Figure 10, Item 6) slowly, using lifting device (Figure 12), until mounting holes on engine mounts align with vibration isolators (Figure 11, Item 4).
11. Move engine (Figure 10, Item 6) horizontally until the flywheel (Figure 10, Item 4) contacts the AC generator drive plate (Figure 10, Item 3).
12. Align screw holes in flywheel (Figure 10, Item 4) with holes in AC generator drive plate (Figure 10, Item 3).
13. Install eight screws (Figure 10, Item 1) and eight flat washers (Figure 10, Item 2) to secure flywheel (Figure 10, Item 4) and AC generator drive plate (Figure 10, Item 3), turning harmonic balancer hex cap screw (not shown) using socket and breaker bar as required to install screws (Figure 10, Item 1).
14. Tighten screws (Figure 10, Item 1) to 35 – 42 ft/lb (48 – 57 Nm).
15. Align screw holes in flywheel housing (Figure 10, Item 5) with AC generator (Figure 10, Item 13).
16. Install 12 screws (Figure 10, Item 12) and 12 flat washers (Figure 10, Item 11) securing flywheel housing (Figure 10, Item 5) to AC generator (Figure 10, Item 13).
17. Tighten screws (Figure 10, Item 12) to 35 – 42 ft/lb (48 – 57 Nm).
18. Install screen (Figure 10, Item 10) to right-side of AC generator (Figure 10, Item 13) with four screws (Figure 10, Item 9) and four washers (Figure 10, Item 8).
19. Repeat step 18 for left-side of AC generator (Figure 10, Item 13).
20. Adjust jack screws (Figure 10, Item 7) in unit skid to ensure engine (Figure 10, Item 6) is sitting level.
21. Remove left-side engine mounting bolt (Figure 11, Item 1) installed upside down in step 9.
22. Install flat washer (Figure 11, Item 2) to engine mounting bolt (Figure 11, Item 1).
23. Install engine mounting bolt (Figure 11, Item 1) with flat washer (Figure 11, Item 2) through unit skid and bottom of vibration isolator (Figure 11, Item 4) on left-side of skid.
24. Install nut (Figure 11, Item 7) and snubbing washer (Figure 11, Item 6) to engine mounting bolt (Figure 11, Item 1) finger-tight to secure engine to skid and vibration isolator (Figure 11, Item 4).
25. Repeat steps 21 through 24 to install engine mounting bolt (Figure 11, Item 1) to right-side of skid.
26. Tighten engine mounting bolts and nuts (Figure 11, Items 1 and 7) to 68 – 83 ft/lb (92 – 112 Nm).
27. Remove lifting device from engine.
28. Install oil drain hose assembly (Figure 8, Item 2) to unit skid by installing two screws (Figure 8, Item 1).

**NOTE**

Remove all wire ties securing hoses and wiring when engine has been secured in position.

29. Install water in fuel sensor connector (Figure 7, Item 7) to wiring harness (Figure 7, Item 8).

**NOTE**

Use tags placed on sensors/senders and wiring harness at removal to assist installation. Leave tags on electrical components until generator set is running properly.

30. Install ECM (WP 0081, Remove/Install Engine ECM).
31. Reroute ECM engine wiring harness (Figure 7, Item 3) and wire (Figure 7, Item 6) around air duct (Figure 7, Item 5) and install to ECM (not shown) (WP 0081, Remove/Install Engine ECM).
32. Install power electrical connector (Figure 7, Item 1) and engine wiring harness multipin connector (Figure 7, Item 2) to ECM (WP 0081, Remove/Install Engine ECM).
33. Install ECM diagnostic port (Figure 7, Item 10) to engine with bolt (Figure 7, Item 9).

**NOTE**

Steps 34 through 35 are only required if the optional winterization kit has been installed.

34. Install winterization kit fuel hose (Figure 6, Item 5) to fuel manifold (Figure 6, Item 3) with hose clamp (Figure 6, Item 4).
35. Install winterization kit fuel hose (Figure 6, Item 5) with two P-clamps (Figure 6, Items 6 and 12) and two bolts (Figure 6, Items 7 and 9).
36. Install coalescer drain hose (Figure 6, Item 15) to engine (Figure 6, Item 13). Position hose clip (Figure 6, Item 14) on coalescer drain hose (Figure 6, Item 15).
37. Install fuel return line (Figure 6, Item 2) to fitting (Figure 6, Item 1).

**NOTE**

Steps 38 through 45 are only required if the optional winterization kit has been installed. Step 38 is required if engine is new and needs to be prepared for winterization kit.

Use pipe sealant on all male pipe threads of adaptor pipe (Figure 5, Item 1) and elbow (Figure 5, Item 2). Cure time is 30 min to use winterization kit and 72 hr for full strength.

38. Remove plug (not shown) from engine.
39. Apply sealant to male threads of adaptor pipe (Figure 5, Item 1) and elbow (Figure 5, Item 2).
40. Install adaptor pipe (Figure 5, Item 1) to engine. Secure adaptor pipe (Figure 5, Item 1) 1 – 1 1/2 turns past finger-tight.
41. Install elbow (Figure 5, Item 2) to adaptor pipe (Figure 5, Item 1). Secure elbow (Figure 5, Item 2) 1 – 1 1/2 turns past finger-tight.
42. Install winterization kit hose (Figure 5, Item 4) to elbow (Figure 5, Item 2).
43. Position hose clip (Figure 5, Item 3) on winterization kit hose (Figure 5, Item 4).
44. Install winterization kit hose (Figure 5, Item 5) to barb (Figure 5, Item 7).
45. Position hose clip (Figure 5, Item 6) on winterization kit hose (Figure 5, Item 5).
46. Install heat shields (Figure 4, Item 1) to bolts (Figure 4, Item 3) with two nuts (Figure 4, Item 2).

47. Install electrical connector (Figure 3, Item 8) to oil pressure sender (Figure 3, Item 7).
48. Install wiring harness ground wire (Figure 3, Item 9) to engine block (Figure 3, Item 3) with screw (Figure 3, Item 10).
49. Route wiring harness and install screws (Figure 3, Items 6 and 11) that secure P-clamps (Figure 3, Items 1 and 5) to flywheel housing (Figure 3, Item 2) and exhaust manifold heat shield (Figure 3, Item 4).
50. Install coalescer hose (Figure 2, Item 3) to valve cover (Figure 2, Item 11).
51. Position hose clip (Figure 2, Item 12) on coalescer hose (Figure 2, Item 3).
52. Install charge air cooler hoses (Figure 2, Items 2 and 4) to intake manifold (Figure 2, Item 10) and turbocharger (Figure 2, Item 13).
53. Position hose clamps (Figure 2, Items 1 and 5) on charge air cooler hoses (Figure 2, Items 2 and 4) at intake manifold (Figure 2, Item 10) and turbocharger (Figure 2, Item 13).
54. Install wire (Figure 2, Item 9) to terminal of intake air heater (Figure 2, Item 6) and secure by installing new lock washer (Figure 2, Item 7) and nut (Figure 2, Item 8).
55. Install starter (not shown), starter wires (Figure 6, Items 10 and 11), and ground strap (Figure 6, Item 8) (WP 0078, Remove/Install Starter).
56. Install battery-charging alternator wiring (WP 0079, Remove/Install Battery-Charging Alternator).
57. Install intake air heater relay (WP 0042, Remove/Install Intake Air Heater Relay).
58. Install cooling hoses and tubes to engine and radiator (WP 0025, Remove/Install Radiator Hose and Tube Assemblies).
59. Install exhaust pipe to engine and muffler (WP 0084, Remove/Install Muffler).
60. Install fuel inlet line to spin-on fuel filter (WP 0072, Remove/Install Spin-On Fuel Filter Assembly).
61. Install air intake hoses (WP 0019, Remove/Install Air Intake Hose Assemblies).
62. Install front body panel (WP 0030, Remove/Install Front Body Panel).
63. Install right-side door frame (WP 0033, Remove/Install Right-Side Body Panel).
64. Install left-side door frame (WP 0032, Remove/Install Left-Side Body Panel).
65. Install top body panel (WP 0029, Remove/Install Top Body Panel).
66. Fill cooling system (WP 0022, Service Cooling System).
67. Fill engine oil (WP 0068, Service Lubrication System).
68. Check fuel level (WP 0044, Service Fuel System).
69. Connect batteries (WP 0037, Remove/Install Batteries).
70. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
71. Start engine and check for proper operation and leaks (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
72. Repair as required.
73. Remove all temporary identification tags/markings from electrical components.
74. Ensure fuel, oil, and coolant levels are at proper operating level (TM 9-6115-752-10).

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL 400 HZ ENGINE ASSEMBLY**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 FT-LB (WP 0179, Table 2, Item 38)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0179, Table 2, Item 39)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Assembly, engine (WP 0135, Repair Parts List, Figure 30, Item 1)

Isolator, vibration (2) (WP 0128, Repair Parts List, Figure 23, Item 11)

Washer, lock (2) (WP 0132, Repair Parts List, Figure 27, Item 3)

Antifreeze, ethylene glycol (WP 0180, Expendable and Durable Items List, Item 2)

Cap set, protective (WP 0180, Item 8)

Compound, antiseize (WP 0180, Item 14)

Distilled water (WP 0180, Item 19)

Fuel, diesel (WP 0180, Item 21)

Grease, electrically conductive (WP 0180, Item 22)

Lubricating oil, engine (WP 0180, Item 25)

Pan, drain (WP 0180, Item 30)

Penetrating oil (WP 0180, Item 31)

Rag, wiping (WP 0180, Item 33)

Sealant (WP 0180, Item 34)

Soap, ivory (WP 0180, Item 35)

Tag, marker (WP 0180, Item 37)

**Personnel Required**

91D (1)

Assistant (2)

**References**

WP 0100, General Maintenance

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Batteries disconnected (WP 0037, Remove/Install Batteries)

Engine oil drained (WP 0068, Service Lubrication System)

Coolant drained (WP 0022, Service Cooling System)

Top panel removed (WP 0029, Remove/Install Top Body Panel)

Left-side door frame removed (WP 0032, Remove/Install Left-Side Body Panel)

Right-side door frame removed (WP 0033, Remove/Install Right-Side Body Panel)

Front body panel removed (WP 0030, Remove/Install Front Body Panel)

Intake air hoses removed from engine (WP 0019, Remove/Install Air Intake Hose Assemblies)

Fuel inlet line removed from spin-on fuel filter (WP 0072, Remove/Install Spin-On Fuel Filter Assembly)

Exhaust pipe removed from engine and muffler (WP 0084, Remove/Install Muffler)

Cooling hoses and tubes removed from engine and radiator (WP 0025, Remove/Install Radiator Hose and Tube Assemblies)

Intake air heater relay removed (WP 0042, Remove/Install Intake Air Heater Relay)

ECM removed from unit bulkhead and set aside for shipment with engine (WP 0081, Remove/Install Engine ECM)

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**INITIAL SETUP — CONTINUED:****Equipment Conditions**

Wiring removed from starter (WP 0078,  
Remove/Install Starter)

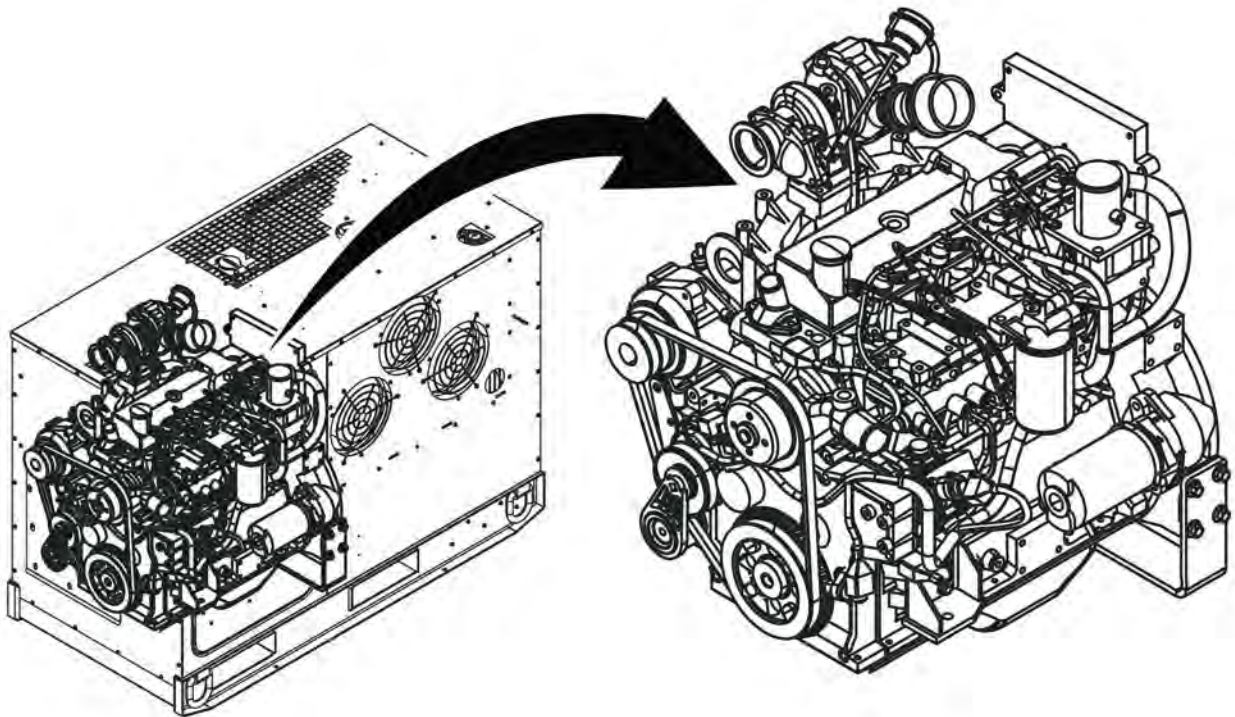
Wiring removed from battery-charging alternator (WP  
0079, Remove/Install Battery-Charging Alternator  
Assembly)

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**REMOVE/INSTALL ENGINE ASSEMBLY****WARNING**

- Engine assembly weighs approximately 818 lb (371 kg). Use suitable lifting device with the capacity to lift the weight of the engine assembly. Failure to comply may cause injury or death to personnel.
- Comply with all lifting requirements. Observe the decals on equipment and parts that identify the weight and determine if assistance is needed. Maximum lift is 37 lb (16.8 kg) for one person, 74 lb (33.6 kg) for two persons, and 101 lb (45.8 kg) for three persons. Failure to comply may cause injury or death to personnel.

## Remove Engine Assembly



**Figure 1. Engine Assembly — Location.**

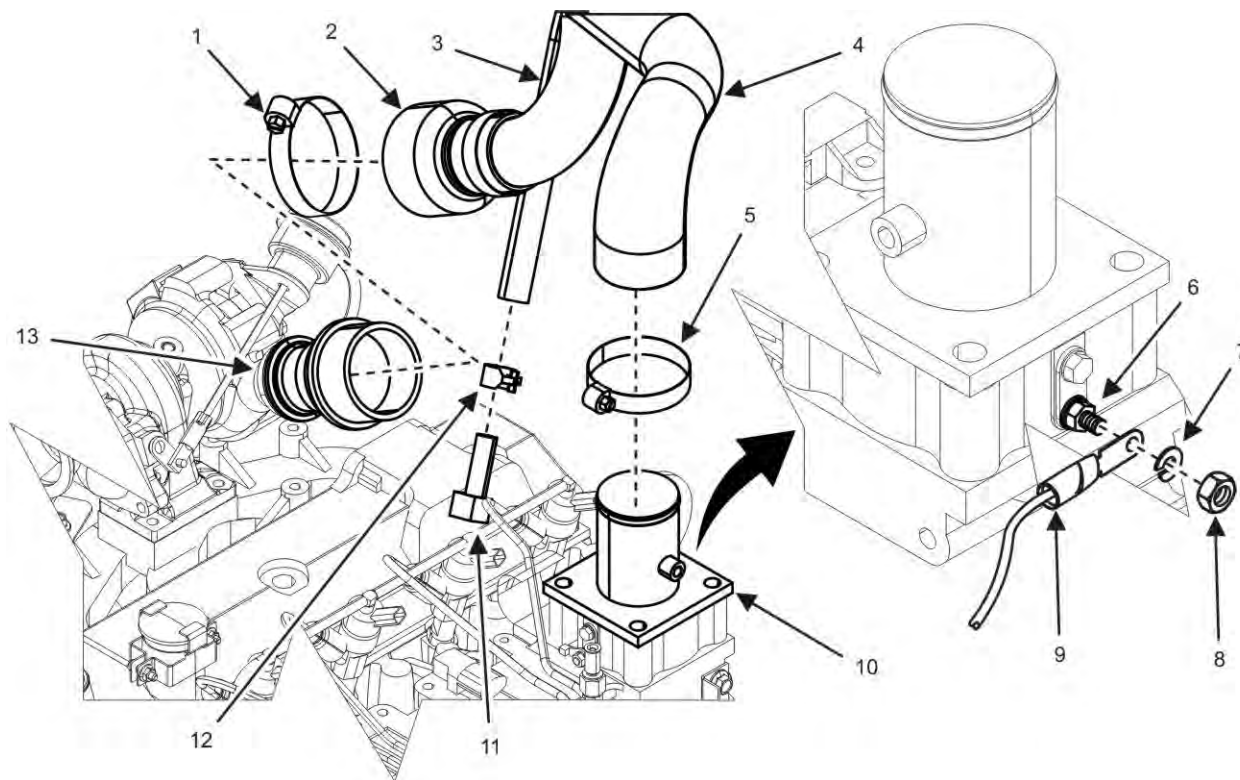
### NOTE

Cap/plug all open fuel hoses/fittings and cooling ports to prevent dirt and debris from entering the engine.

Tag all electrical wires and connectors prior to removal to aid installation. Remove tags from wires and connectors at installation.

All parts removed or disconnected from the engine assembly are intended for reuse at time of reassembly unless they are damaged and must be replaced.

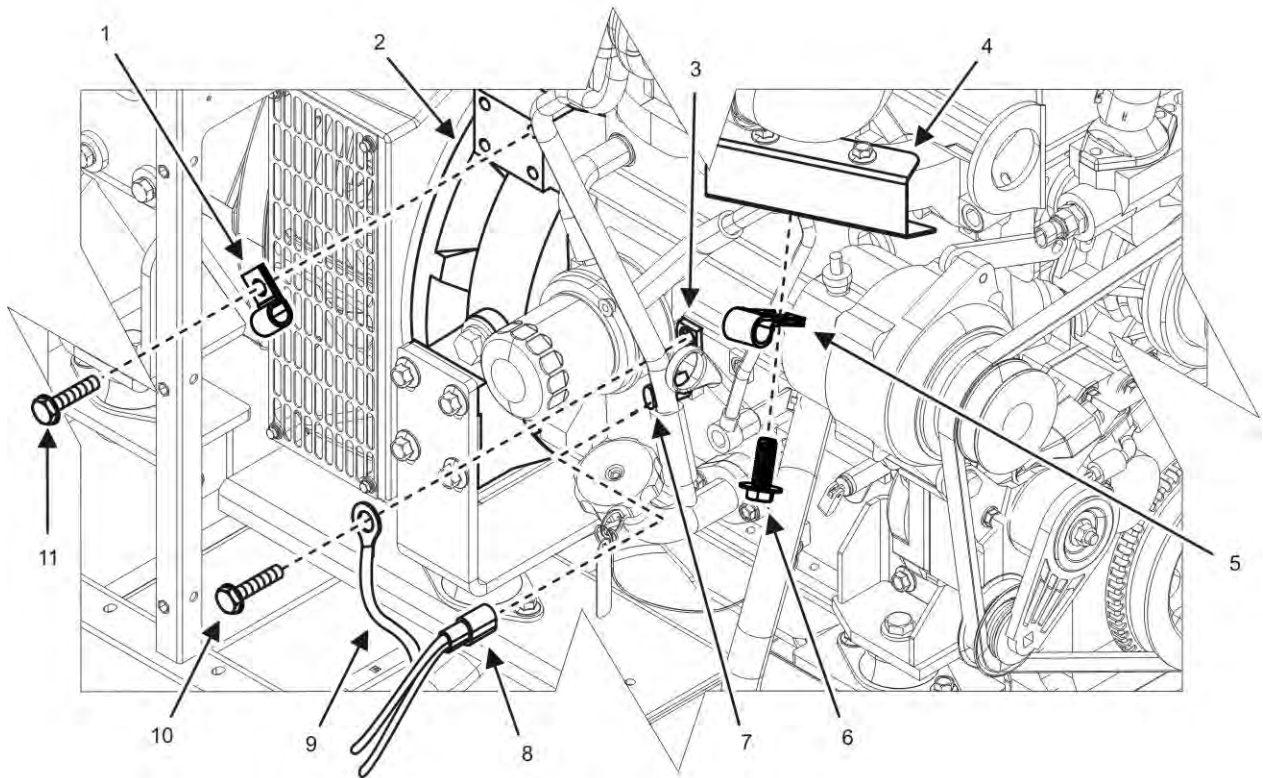
1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate engine on generator set skid (Figure 1).



**Figure 2. Electrical Connections and Hoses — Top of Engine.**

3. Remove nut (Figure 2, Item 8) and lock washer (Figure 2, Item 7) that secure wire (Figure 2, Item 9) to terminal on intake air heater (Figure 2, Item 6). Discard lock washer (Figure 2, Item 7).
4. Remove wire (Figure 2, Item 9) from terminal on intake air heater (Figure 2, Item 6).
5. Reposition wire (Figure 2, Item 9) and secure with wire ties to prevent damage during removal or installation.
6. Reposition hose clamps (Figure 2, Items 1 and 5) on charge air cooler hoses (Figure 2, Items 2 and 4) at intake manifold (Figure 2, Item 10) and turbocharger (Figure 2, Item 13).
7. Remove charge air cooler hoses (Figure 2, Items 2 and 4) from intake manifold (Figure 2, Item 10) and turbocharger (Figure 2, Item 13).
8. Reposition hoses (Figure 2, Items 2 and 4) and secure with wire ties to prevent damage during removal or installation.
9. Reposition hose clip (Figure 2, Item 12) on coalescer hose (Figure 2, Item 3) attached to valve cover (Figure 2, Item 11).
10. Remove coalescer hose (Figure 2, Item 3) from valve cover (Figure 2, Item 11).
11. Reposition hose (Figure 2, Item 3) and secure with wire tie to prevent damage during removal or installation.



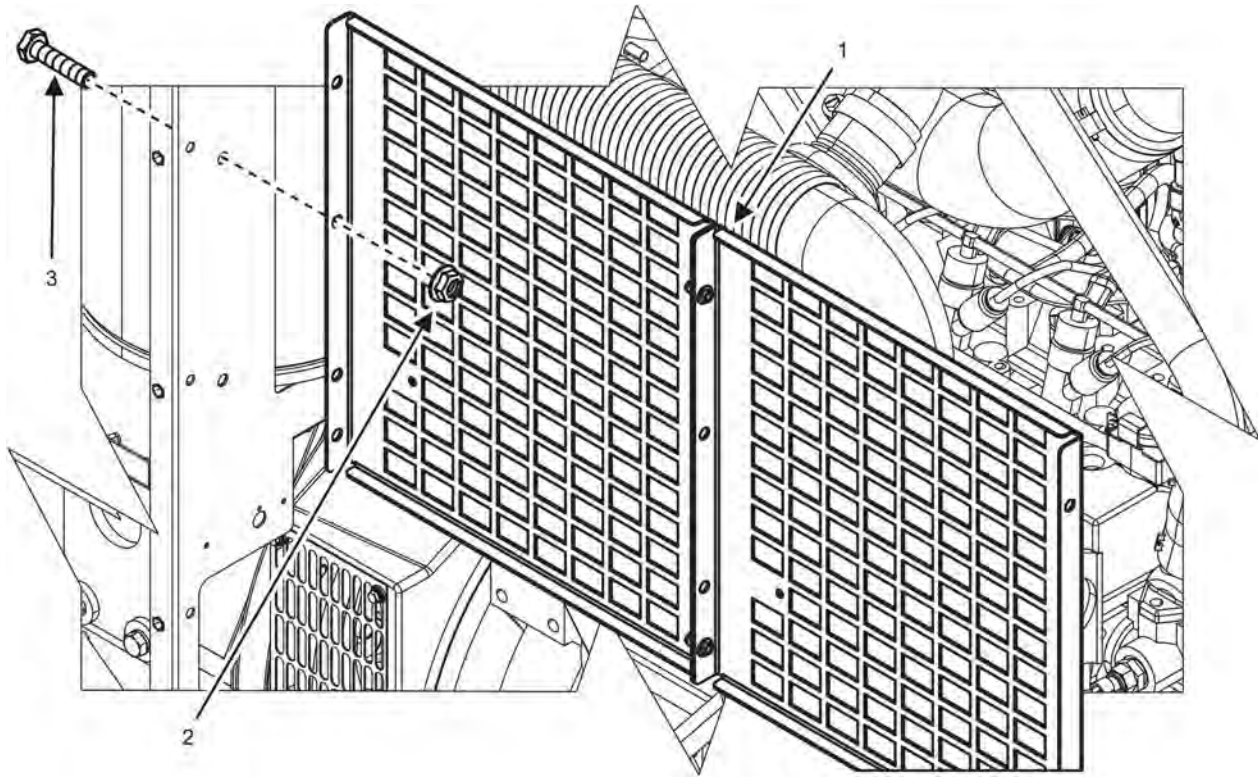


**Figure 3. P-Clamp — Removal.**

### NOTE

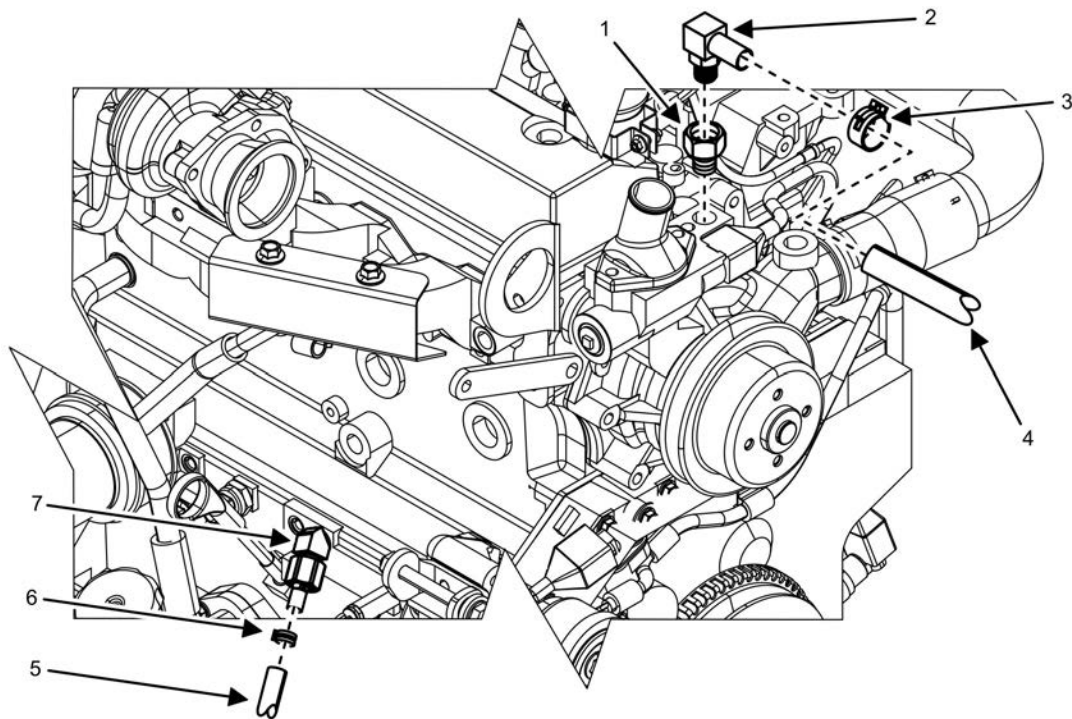
Engine wiring harnesses and hoses are secured to unit in several places by P-clamps. P-clamps must be removed to remove hoses and wiring and reposition hoses and wiring harnesses to allow engine removal.

12. Remove screws (Figure 3, Items 6 and 11) that secure P-clamps (Figure 3, Items 1 and 5) to flywheel housing (Figure 3, Item 2) and exhaust manifold heat shield (Figure 3, Item 4).
13. Remove screw (Figure 3, Item 10) securing wiring harness ground wire (Figure 3, Item 9) to engine block (Figure 3, Item 3).
14. Remove wiring harness ground wire (Figure 3, Item 9) to engine block (Figure 3, Item 3).
15. Remove electrical connector (Figure 3, Item 8) from oil pressure sender (Figure 3, Item 7).
16. Reposition wiring harness electrical connector (Figure 3, Item 8) and ground wire (Figure 3, Item 9), and secure with wire ties to prevent damage during removal or installation.



**Figure 4. Heat Shield — Removal.**

17. Remove two nuts (Figure 4, Item 2) from two bolts (Figure 4, Item 3) securing heat shields (Figure 4, Item 1) to unit bulkhead without removing bolts (Figure 4, Item 3).
18. Remove heat shields (Figure 4, Item 1) from bolts (Figure 4, Item 3) on unit bulkhead.



**Figure 5. Engine Hoses and Wires — Right-Side.**

### **NOTE**

Steps 19 through 23 are only required if the optional winterization kit has been installed.

19. Reposition hose clip (Figure 5, Item 6) on winterization kit hose (Figure 5, Item 5) located on barb (Figure 5, Item 7) at right-side of engine.
20. Remove winterization kit hose (Figure 5, Item 5) from barb (Figure 5, Item 7).
21. Reposition hose clip (Figure 5, Item 3) on winterization kit hose (Figure 5, Item 4) and elbow (Figure 5, Item 2).
22. Remove winterization kit hose (Figure 5, Item 4) from elbow (Figure 5, Item 2).
23. Remove elbow (Figure 5, Item 2) and adaptor pipe (Figure 5, Item 1) from engine.

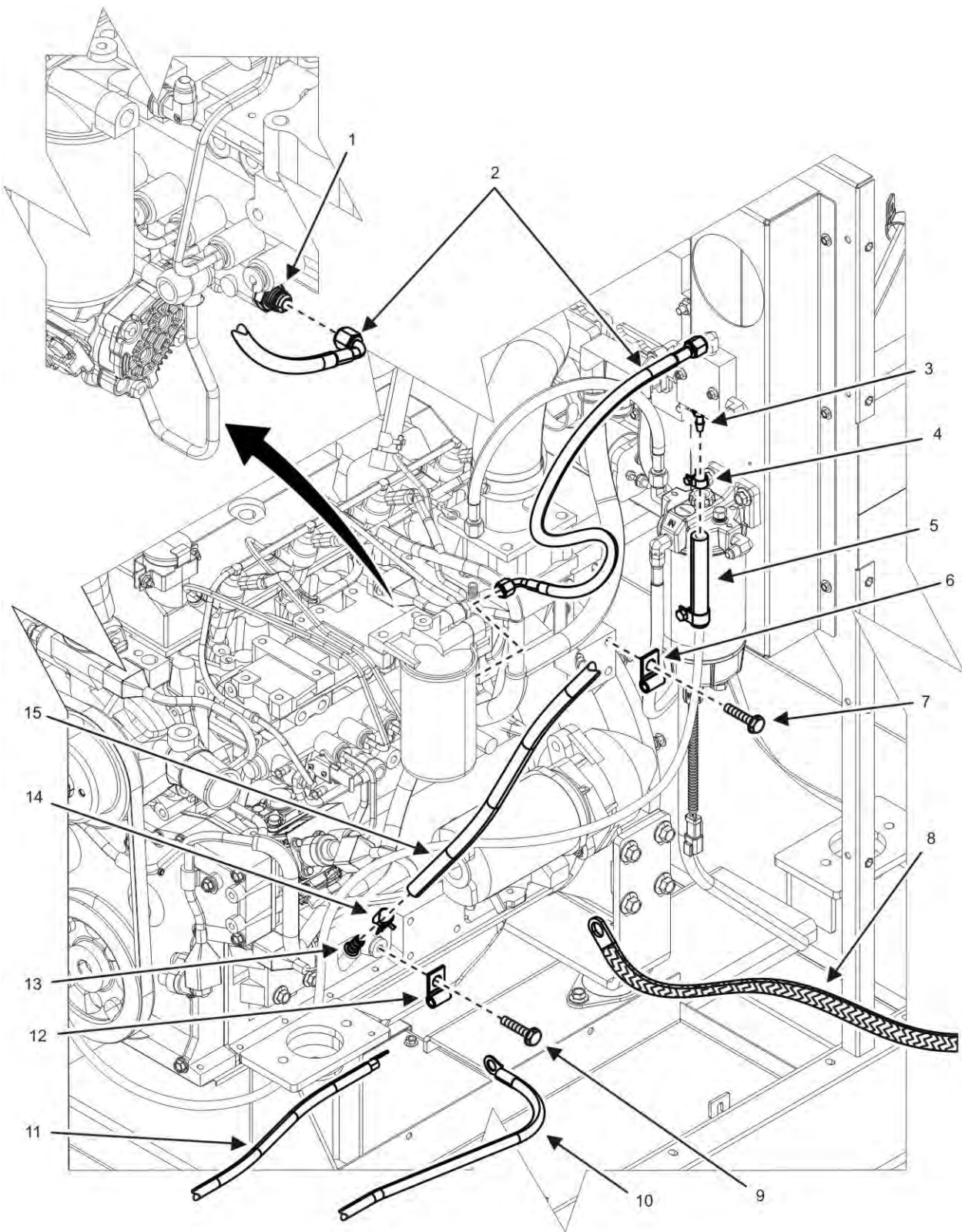


Figure 6. Engine Hoses, Wires and P-Clamps — Left-Side.

- 
24. Remove fuel return line (Figure 6, Item 2) from fitting (Figure 6, Item 1).
  25. Reposition hose clip (Figure 6, Item 14) at coalescer drain hose (Figure 6, Item 15) on engine (Figure 6, Item 13).
  26. Remove coalescer drain hose (Figure 6, Item 15) from engine (Figure 6, Item 13).

### NOTE

Steps 27 through 30 are only required if the optional winterization kit has been installed.

27. Remove two bolts (Figure 6, Items 7 and 9) and two P-clamps (Figure 6, Items 6 and 12) securing winterization kit fuel hose (Figure 6, Item 5) to engine (Figure 6, Item 13).
28. Loosen hose clamp (Figure 6, Item 4) and slide back on winterization kit fuel hose (Figure 6, Item 5).
29. Remove winterization kit fuel hose (Figure 6, Item 5) from fuel manifold (Figure 6, Item 3).
30. Secure winterization kit fuel hose (Figure 6, Item 5) with wire ties to prevent damage during removal and installation of engine.
31. Remove ground strap (Figure 6, Item 8) from engine if not removed with starter wires (Figure 6, Items 10 and 11) (WP 0078, Remove/Install Starter).
32. Secure ground strap (Figure 6, Item 8) and starter wires (Figure 6, Items 10 and 11) with wire ties to prevent damage during removal and installation of engine.

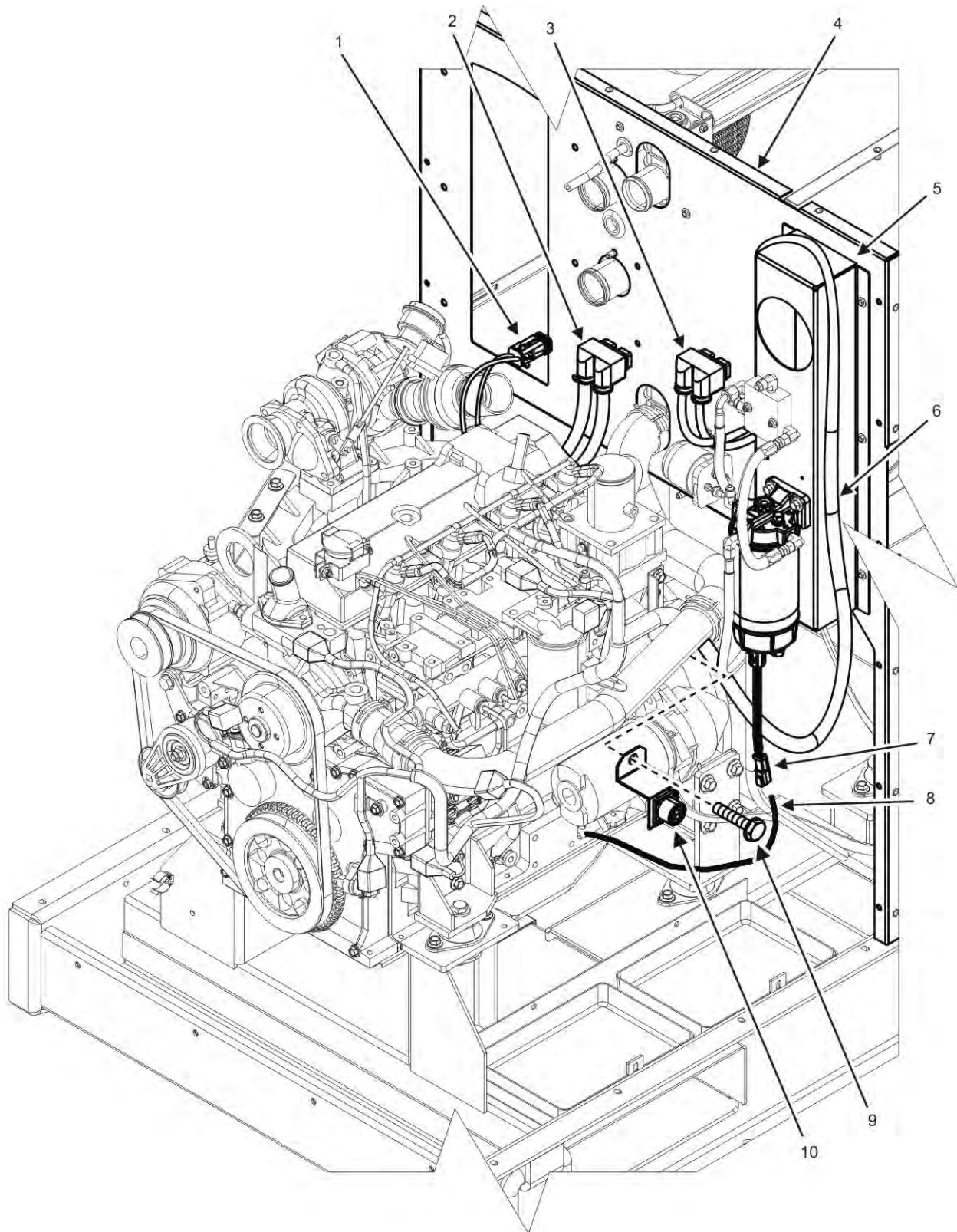


Figure 7. ECM and ECM Wiring Harness — Removal.

**CAUTION**

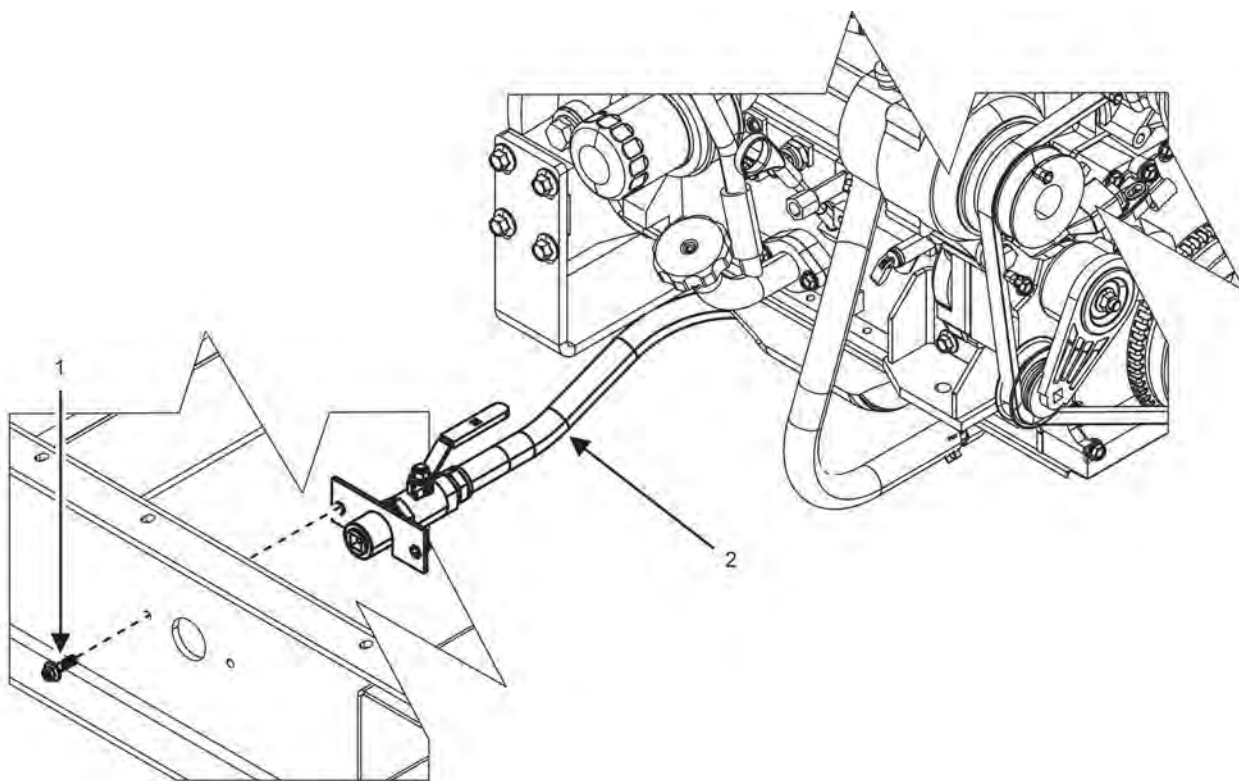
Loose wiring can easily be damaged during engine removal. Move remaining wiring to the outside perimeter of the unit skid, away from the engine assembly. Failure to comply may cause damage to equipment.

33. Remove bolt (Figure 7, Item 9) that secures ECM diagnostic port (Figure 7, Item 10) to engine.
34. Remove ECM diagnostic port (Figure 7, Item 10) from engine.
35. Secure power electrical connector (Figure 7, Item 1), engine wiring harness multipin connector (Figure 7, Item 2), and ECM diagnostic port (Figure 7, Item 10) to unit bulkhead (Figure 7, Item 4) or generator set with wire ties to prevent damage during removal.

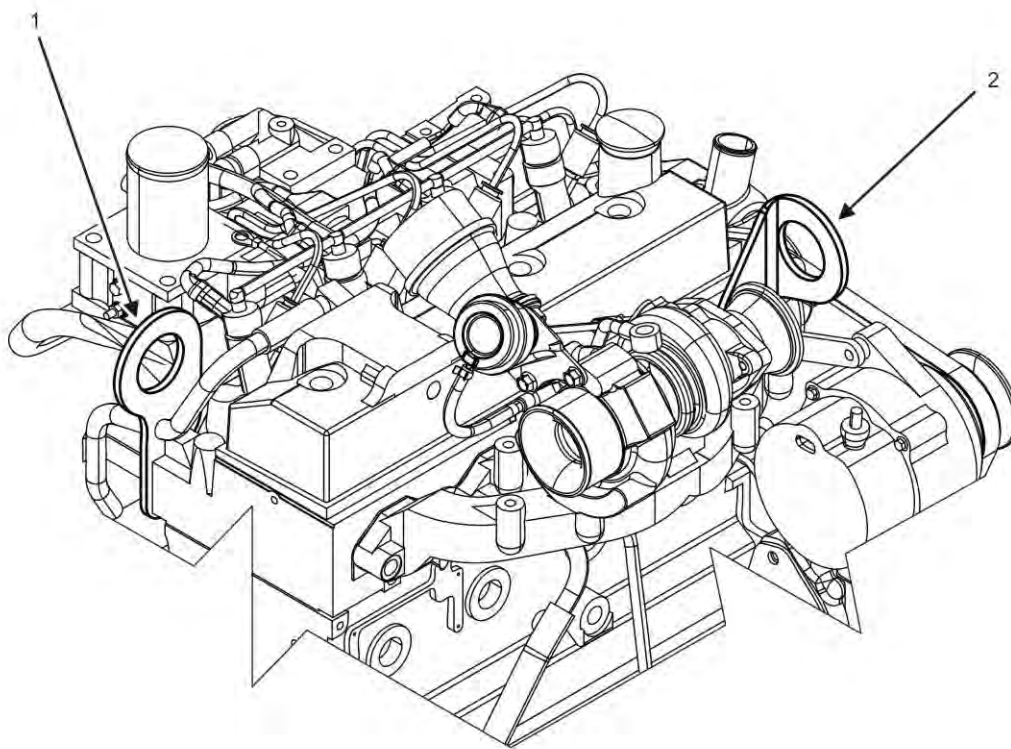
**CAUTION**

Ensure ECM wiring harness is not damaged while removing from unit and attaching to engine. Failure to comply will cause damage to equipment.

36. Reroute ECM engine wiring harness (Figure 7, Item 3) and wire (Figure 7, Item 6) from air duct (Figure 7, Item 5) to engine.
37. Secure ECM engine wiring harness (Figure 7, Item 3) to engine with wire ties to prevent damage during removal.
38. Disconnect water in fuel sensor connector (Figure 7, Item 7) from wiring harness (Figure 7, Item 8).
39. Secure wiring harness (Figure 7, Item 8) to unit skid with wire ties to prevent damage during removal of engine.



**Figure 8. Engine Oil Drain Hose Assembly.**



**Figure 9. Lifting Eyes.**

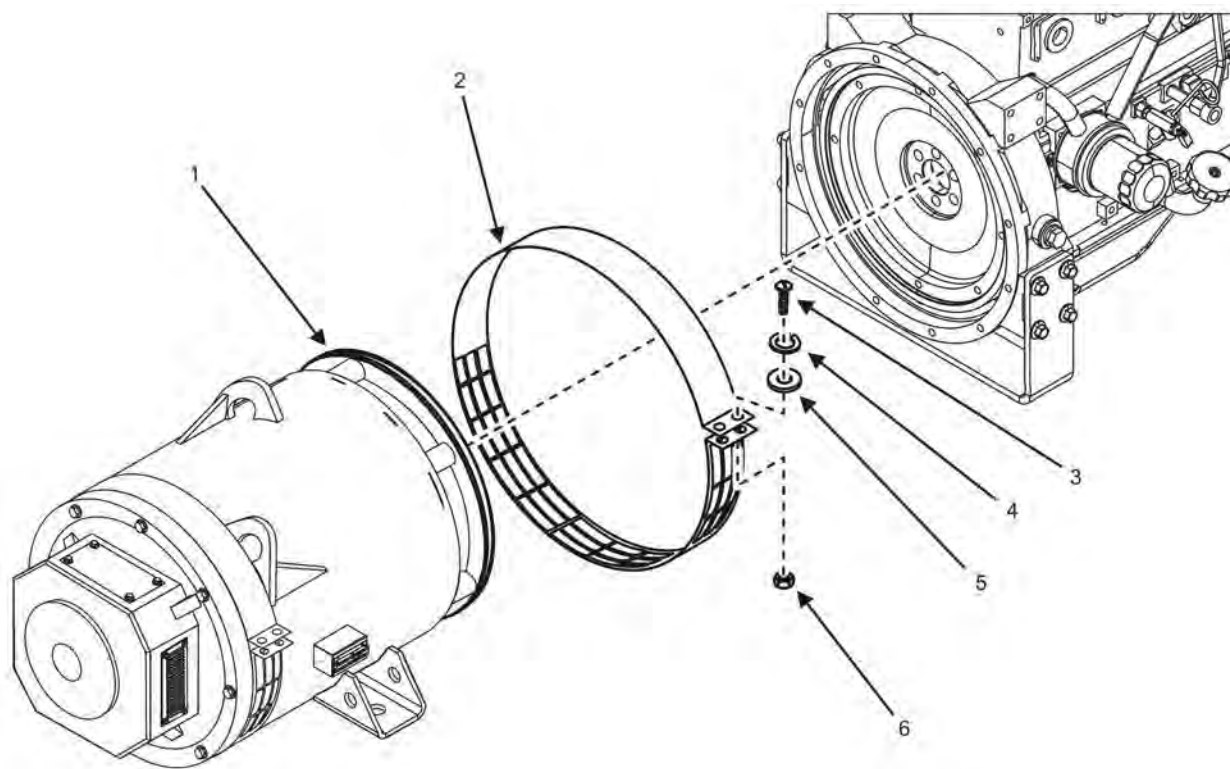
40. Remove two screws (Figure 8, Item 1) that secure engine oil drain hose assembly (Figure 8, Item 2) to unit skid.
41. Remove engine oil drain hose assembly (Figure 8, Item 2) from unit skid.
42. Inspect lifting eyes (Figure 9, Items 1 and 2) for damage and missing or loose attaching hardware (not shown).
43. Replace damaged lifting eyes (Figure 9, Items 1 and 2) and missing hardware (not shown) as required.
44. Tighten loose lifting eye hardware (not shown) to 34 – 37 ft/lb (47 – 51 Nm) as required.
45. Attach suitable lifting device to lifting eyes (Figure 9, Items 1 and 2) of engine.

**NOTE**

Chains on lifting device should be taut with no slack.

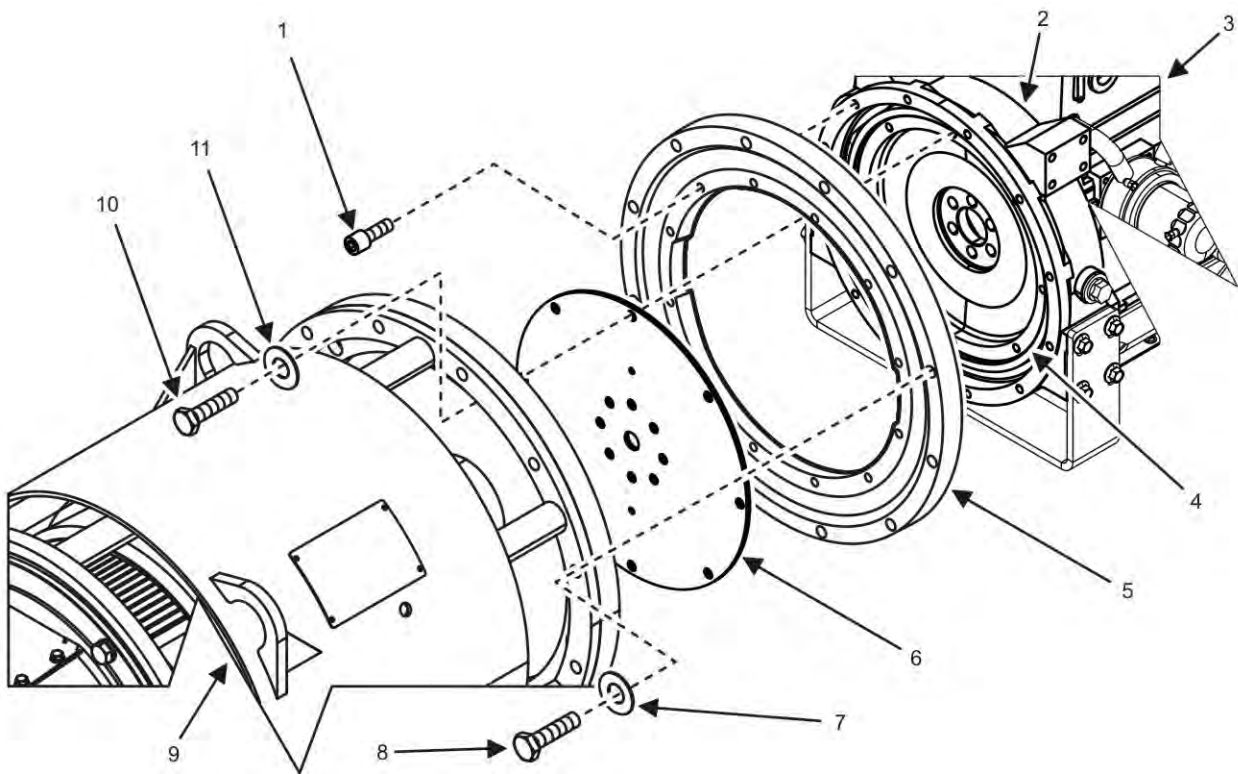
46. Raise lifting device to remove slack in lifting device.





**Figure 10. Screen — Removal.**

47. Remove two screws (Figure 10, Item 3), two lock washers (Figure 10, Item 4), two washers (Figure 10, Item 5), and two nuts (Figure 10, Item 6) securing screen (Figure 10, Item 2) over AC generator (Figure 10, Item 1). Discard lock washers (Figure 10, Item 4).
48. Remove screen (Figure 10, Item 2) from AC generator (Figure 10, Item 1).

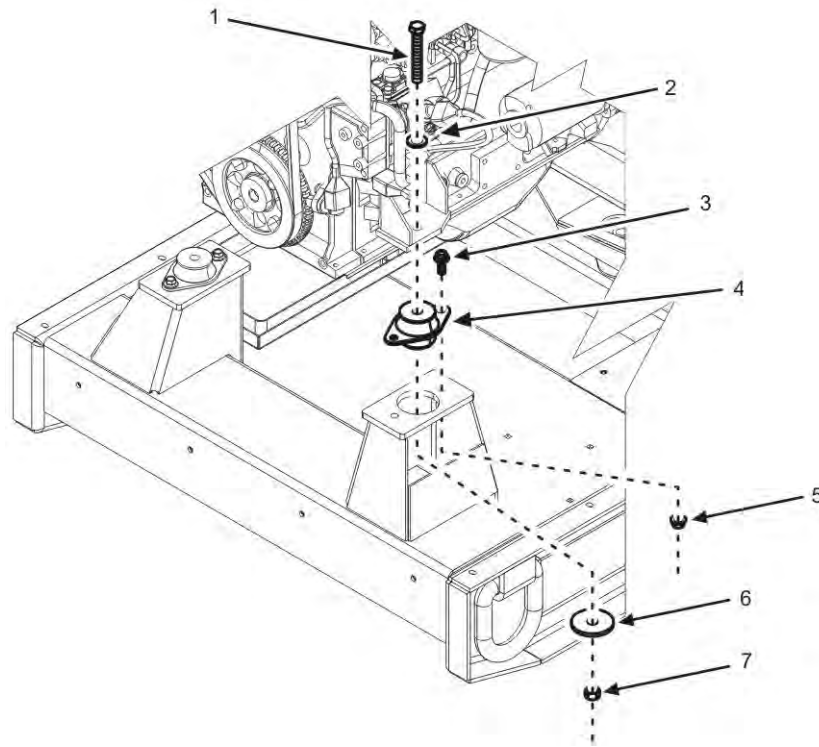


**Figure 11. Detach Engine from AC Generator.**

### **CAUTION**

AC generator must be secured in place during engine removal. Failure to comply will cause damage to equipment.

49. Place blocking under AC generator (Figure 11, Item 9) to keep generator level.
50. Remove 12 screws (Figure 11, Item 8) and 12 flat washers (Figure 11, Item 7) securing AC generator (Figure 11, Item 9) to spacer (Figure 11, Item 5) on engine (Figure 11, Item 3).
51. Remove eight screws (Figure 11, Item 10) and eight flat washers (Figure 11, Item 11) that secure flywheel (Figure 11, Item 4) to AC generator drive plate (Figure 11, Item 6), turning harmonic balancer hex cap screw (not shown) using socket and breaker bar as required to access screws (Figure 11, Item 10).



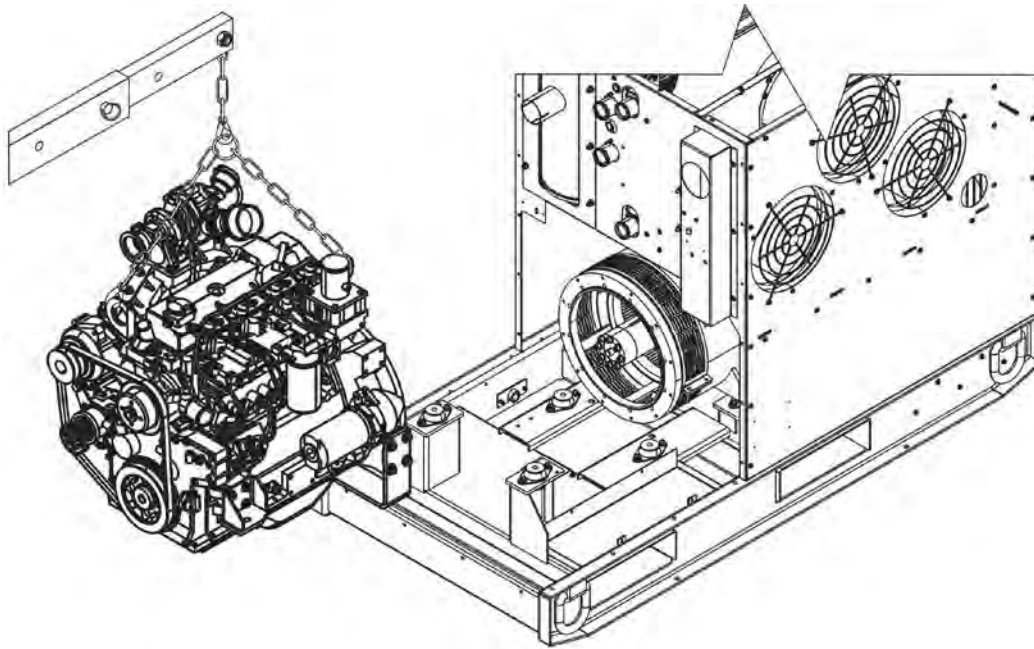
**Figure 12. Engine Mounting Bolts — Removal.**

52. Remove engine mounting bolt (Figure 12, Item 1), flat washer (Figure 12, Item 2), snubbing washer (Figure 12, Item 6), and nut (Figure 12, Item 7) securing engine to left-side vibration isolator (Figure 12, Item 4).
53. Remove two bolts (Figure 12, Item 3) and two nuts (Figure 12, Item 5) that secure vibration isolator (Figure 12, Item 4) to unit skid.
54. Remove and discard vibration isolator (Figure 12, Item 4) from unit skid.
55. Repeat steps 52 through 54 for right-side vibration isolator (Figure 12, Item 4).

### **WARNING**

When lifting engine, use lifting equipment with minimum lifting capacity of 1000 lb (453.6 kg). Do not stand or put arms, legs, or any body part under hoisted load. Do not permit generator set to swing. Failure to comply may cause injury or death to personnel.

56. Lift engine (Figure 11, Item 3) slowly until just free of engine mounts using suitable lifting device (Figure 13).



**Figure 13. Engine — Removal.**

### **CAUTION**

Do not permit AC generator rotor to remain attached to flywheel. Failure to comply will cause damage to equipment.

### **NOTE**

If AC generator drive plate (Figure 11, Item 6) remains attached to flywheel (Figure 11, Item 4), perform steps 57 through 59 to separate flywheel (Figure 11, Item 4) and AC generator drive plate (Figure 11, Item 6).

57. Saturate area where flywheel (Figure 11, Item 4) and AC generator drive plate (Figure 11, Item 6) are connected with penetrating oil.
58. Allow penetrating oil to soak for 1 hr.
59. Strike point of contact between flywheel (Figure 11, Item 4) and AC generator drive plate (Figure 11, Item 6) using a hammer and brass drift around circumference of flywheel (Figure 11, Item 4) until the two components break free.
60. Move engine (Figure 11, Item 3) horizontally away from AC generator (Figure 11, Item 9) carefully to separate flywheel (Figure 11, Item 4) from AC generator drive plate (Figure 11, Item 6).
61. Remove engine (Figure 11, Item 3) from unit.
62. Secure engine (Figure 11, Item 3) to engine stand or other suitable work surface.
63. Remove lifting device from engine (Figure 13).
64. Remove 12 screws (Figure 11, Item 8) securing spacer (Figure 11, Item 5) to engine (Figure 11, Item 3).

## CAUTION

Engine ECM must be shipped with engine for proper overhaul, troubleshooting, and analysis. Ensure ECM is attached away from hot or moving parts. Failure to comply may cause damage to equipment.

65. Attach engine ECM (removed as part of equipment conditions, not shown) to engine ECM wiring harness (Figure 7, Item 3) and secure to engine (Figure 11, Item 3) with wiring ties.

## END OF TASK

### Inspect Engine Assembly

1. Inspect engine (Figure 11, Item 3) for signs of obvious damage to components.
2. Replace damaged components as required.
3. Inspect screws and washers (Figure 11, Items 1, 8, 10, and 11) for damage, deterioration, or wear. Replace as required.
4. Inspect mounting location on unit skid for damage, corrosion, or cracks. Replace unit skid as required.
5. Inspect oil drain hose assembly (Figure 8, Item 2) and fuel return line (Figure 6, Item 2) for damage. Replace as required.
6. Inspect winterization kit hoses (if installed) (Figure 5, Items 4 and 5) and winterization kit fuel hose (Figure 6, Item 5) for signs of obvious damage. Replace damaged components as required.
7. Inspect coalescer hoses (Figure 6, Item 15 and Figure 2, Item 3) for signs of obvious damage. Replace as required.
8. Inspect charge air cooler hoses (Figure 2, Items 2 and 4) for signs of obvious damage. Replace as required.
9. Inspect ground strap (Figure 6, Item 8) for signs of fraying or obvious damage. Replace as required.
10. Inspect ECM engine harness plug (Figure 7, Item 3) at the ECM, and inspect ECM (not shown) for damage. Replace as required (WP 0081, Remove/Install Engine ECM and WP 0087, Remove/Install ECM Wiring Harness).
11. Inspect electrical connectors on wires (Figure 2, Item 9; Figure 3, Items 8 and 9; and Figure 7, Items 1, 2, 7, and 8) for signs of obvious damage.
12. Repair or replace damaged electrical connectors (WP 0039, Remove/Install Engine Wiring Harness and WP 0100, General Maintenance).
13. Inspect AC generator screen (Figure 10, Item 2) for damage. Replace as required.

## END OF TASK

### Install Engine Assembly

1. Position two new vibration isolators (Figure 12, Item 4) to mounting locations on unit skid and secure to each location by installing two bolts (Figure 12, Item 3) and two nuts (Figure 12, Item 5) finger-tight.
2. Tighten vibration isolator mounting nuts (Figure 12, Item 5) to 35 – 42 ft/lb (48 – 57 Nm).
3. Install spacer (Figure 11, Item 5) and 12 screws (Figure 11, Item 1) securing spacer (Figure 11, Item 5) to engine (Figure 11, Item 3).
4. Tighten 12 screws (Figure 11, Item 1) to 35.40 – 42.04 ft/lb (48 – 57 Nm).
5. Inspect lifting eyes (Figure 9, Items 1 and 2) for damage and missing or loose attaching hardware.
6. Replace damaged lifting eyes (Figure 9, Items 1 and 2) and missing hardware as required.
7. Tighten loose lifting eye hardware to 34 – 37 ft/lb (47 – 51 Nm) as required.

8. Attach suitable lifting device to lifting eyes (Figure 9, Items 1 and 2) of engine.
9. Raise engine assembly using lifting device (Figure 13).
10. Position engine to its approximate mounting location in unit skid.

### CAUTION

Use caution when lowering the engine assembly not to kink the engine oil drain line. As engine assembly is lowered, position engine oil drain line toward left-side of unit skid. Failure to comply may cause damage to equipment.

Loose wiring can easily be damaged during engine installation. Move remaining wiring to the outside perimeter of the unit skid, away from the engine assembly. Failure to comply may cause damage to equipment.

11. Position engine mounting bolts (Figure 12, Item 1) upside down in bottom of vibration isolators (Figure 12, Item 4) to assist with alignment.
12. Lower engine (Figure 11, Item 3) slowly, using lifting device (Figure 13), until mounting holes on engine mounts align with vibration isolators (Figure 12, Item 4).
13. Move engine horizontally until the flywheel (Figure 11, Item 4) contacts the AC generator drive plate (Figure 11, Item 6).
14. Align screw holes in flywheel (Figure 11, Item 4) with holes in AC generator drive plate (Figure 11, Item 6).
15. Install eight screws (Figure 11, Item 10) and eight flat washers (Figure 11, Item 11) to secure flywheel (Figure 11, Item 4) and AC generator drive plate (Figure 11, Item 6), turning harmonic balancer hex cap screw (not shown) using socket and breaker bar as required to access screws (Figure 11, Item 10).
16. Align screw holes in spacer (Figure 11, Item 5) with AC generator (Figure 11, Item 9).
17. Install 12 screws (Figure 11, Item 8) and 12 flat washers (Figure 11, Item 7) securing flywheel housing (Figure 11, Item 2) to AC generator (Figure 11, Item 9).
18. Tighten 12 screws (Figure 11, Item 8) to 35 – 42 ft/lb (48 – 57 Nm).
19. Tighten eight screws (Figure 11, Item 10) to 35 – 42 ft/lb (48 – 57 Nm).
20. Install screen (Figure 10, Item 2) to AC generator (Figure 10, Item 1) with two screws (Figure 10, Item 3), two new lock washers (Figure 10, Item 4), two washers (Figure 10, Item 5), and two nuts (Figure 10, Item 6).
21. Remove blocking from AC generator (Figure 11, Item 9).
22. Remove left-side engine mounting bolt (Figure 12, Item 1) installed upside down in step 11.
23. Install flat washer (Figure 12, Item 2) to engine mounting bolt (Figure 12, Item 1).
24. Install engine mounting bolt (Figure 12, Item 1) with flat washer (Figure 12, Item 2) through unit skid and bottom of vibration isolator (Figure 12, Item 4) on left-side of skid.
25. Install nut (Figure 12, Item 7) and snubbing washer (Figure 12, Item 6) to engine mounting bolt (Figure 12, Item 1) finger-tight to secure engine to skid and vibration isolator (Figure 12, Item 4).
26. Repeat steps 22 through 25 to install engine mounting bolt (Figure 12, Item 1) to right-side of skid.
27. Tighten engine mounting nuts (Figure 12, Item 7) to 68 – 83 ft/lb (92 – 112 Nm).
28. Remove lifting device from engine (Figure 13).
29. Install oil drain hose assembly (Figure 8, Item 1) to unit skid by installing two screws (Figure 8, Item 2).

## NOTE

Remove all wire ties securing hoses and wiring when engine has been secured in position.

30. Install water in fuel sensor connector (Figure 7, Item 7) to wiring harness (Figure 7, Item 8).

## NOTE

Use tags placed on sensors/senders and wiring harness at removal to assist installation. Leave tags on electrical components until generator set is running properly.

31. Install ECM (WP 0081, Remove/Install Engine ECM).
32. Reroute ECM engine wiring harness (Figure 7, Item 3) and wire (Figure 7, Item 6) around air duct (Figure 7, Item 5) and install to ECM (not shown) (WP 0081, Remove/Install Engine ECM).
33. Install power electrical connector (Figure 7, Item 1) and engine wiring harness multipin connector (Figure 7, Item 2) to ECM (WP 0081, Remove/Install Engine ECM).
34. Install ECM diagnostic port (Figure 7, Item 10) to engine with bolt (Figure 7, Item 9).

## NOTE

Steps 35 through 36 are only required if the optional winterization kit has been installed.

35. Install winterization kit fuel hose (Figure 6, Item 5) to fuel manifold (Figure 6, Item 3) with hose clamp (Figure 6, Item 4).
36. Install winterization kit fuel hose (Figure 6, Item 5) with two P-clamps (Figure 6, Items 6 and 12) and two bolts (Figure 6, Items 7 and 9).
37. Install coalescer drain hose (Figure 6, Item 15) to engine (Figure 6, Item 13). Position hose clip (Figure 6, Item 14) on coalescer drain hose (Figure 6, Item 15).
38. Install fuel return line (Figure 6, Item 2) to fitting (Figure 6, Item 1).

## NOTE

Steps 39 through 46 are only required if the optional winterization kit has been installed. Step 39 is required if engine is new and needs to be prepared for winterization kit.

Use pipe sealant on all male pipe threads of adaptor pipe (Figure 5, Item 1) and elbow (Figure 5, Item 2). Cure time is 30 min to use winterization kit and 72 hr for full strength.

39. Remove plug (not shown) from engine.
40. Apply sealant to male threads of adaptor pipe (Figure 5, Item 1) and elbow (Figure 5, Item 2).
41. Install adaptor pipe (Figure 5, Item 1) to engine. Secure adaptor pipe (Figure 5, Item 1) 1 – 1 1/2 turns past finger-tight.
42. Install elbow (Figure 5, Item 2) to adaptor pipe (Figure 5, Item 1). Secure elbow (Figure 5, Item 2) 1 – 1 1/2 turns past finger-tight.
43. Install winterization kit hose (Figure 5, Item 4) to elbow (Figure 5, Item 2).
44. Position hose clip (Figure 5, Item 3) on winterization kit hose (Figure 5, Item 4).
45. Install winterization kit hose (Figure 5, Item 5) to barb (Figure 5, Item 7).
46. Position hose clip (Figure 5, Item 6) on winterization kit hose (Figure 5, Item 5).
47. Install heat shields (Figure 4, Item 1) to bolts (Figure 4, Item 3) with two nuts (Figure 4, Item 2).

48. Install electrical connector (Figure 3, Item 8) to oil pressure sender (Figure 3, Item 7).
49. Install wiring harness ground wire (Figure 3, Item 9) to engine block (Figure 3, Item 3) with screw (Figure 3, Item 10).
50. Route wiring harness and install screws (Figure 3, Items 6 and 11) that secure P-clamps (Figure 3, Items 1 and 5) to flywheel housing (Figure 3, Item 2) and exhaust manifold heat shield (Figure 3, Item 4).
51. Install coalescer hose (Figure 2, Item 3) to valve cover (Figure 2, Item 11).
52. Position hose clip (Figure 2, Item 12) on coalescer hose (Figure 2, Item 3).
53. Install charge air cooler hoses (Figure 2, Items 2 and 4) to intake manifold (Figure 2, Item 10) and turbocharger (Figure 2, Item 13).
54. Position hose clamps (Figure 2, Items 1 and 5) on charge air cooler hoses (Figure 2, Items 2 and 4) at intake manifold (Figure 2, Item 10) and turbocharger (Figure 2, Item 13).
55. Install wire (Figure 2, Item 9) to terminal of intake air heater (Figure 2, Item 6) and secure by installing new lock washer (Figure 2, Item 7) and nut (Figure 2, Item 8).
56. Install starter (not shown), starter wires (Figure 6, Items 10 and 11), and ground strap (Figure 6, Item 8) (WP 0078, Remove/Install Starter).
57. Install battery-charging alternator wiring (WP 0079, Remove/Install Battery-Charging Alternator).
58. Install intake air heater relay (WP 0042, Remove/Install Intake Air Heater Relay).
59. Install cooling hoses and tubes to engine and radiator (WP 0025, Remove/Install Radiator Hose and Tube Assemblies).
60. Install exhaust pipe to engine and muffler (WP 0084, Remove/Install Muffler).
61. Install fuel inlet line to spin-on fuel filter (WP 0072, Remove/Install Spin-On Fuel Filter Assembly).
62. Install air intake hoses (WP 0019, Remove/Install Air Intake Hose Assemblies).
63. Install front body panel (WP 0030, Remove/Install Front Body Panel).
64. Install right-side door frame (WP 0033, Remove/Install Right-Side Body Panel).
65. Install left-side door frame (WP 0032, Remove/Install Left-Side Body Panel).
66. Install top body panel (WP 0029, Remove/Install Top Body Panel).
67. Fill cooling system (WP 0022, Service Cooling System).
68. Fill engine oil (WP 0068, Service Lubrication System).
69. Check fuel level (WP 0044, Service Fuel System).
70. Connect batteries (WP 0037, Remove/Install Batteries).
71. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
72. Start engine and check for proper operation and leaks (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
73. Repair as required.
74. Remove all temporary identification tags/markings from electrical components.
75. Ensure fuel, oil, and coolant levels are at proper operating level (TM 9-6115-752-10).

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**SERVICE LUBRICATION SYSTEM**

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**INITIAL SETUP:**

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)  
 Wrench, Oil Filter, Strap (WP 0179, Table 2, Item 37)

**Materials/Parts**

Element, Lubricating Oil Filter (1) (WP 0138, Repair Parts List, Figure 33, Item 7)  
 Antifreeze, ethylene glycol (WP 0180, Expendable and Durable Items List, Item 2)  
 Cap set, protective (WP 0180, Item 8)  
 Lubricating oil, engine (WP 0180, Item 25)  
 Lubricating oil, engine (WP 0180, Item 26)  
 Lubricating oil, engine (WP 0180, Item 27)  
 Pan, drain (WP 0180, Item 30)  
 Rag, wiping (WP 0180, Item 33)

**Personnel Required**

91D (1)

**References**

MIL-PRF-2104H  
 MIL-PRF-46167D  
 TB-43-0211 (AOAP)  
 WP 0037, Remove/Install Batteries

**Equipment Conditions**

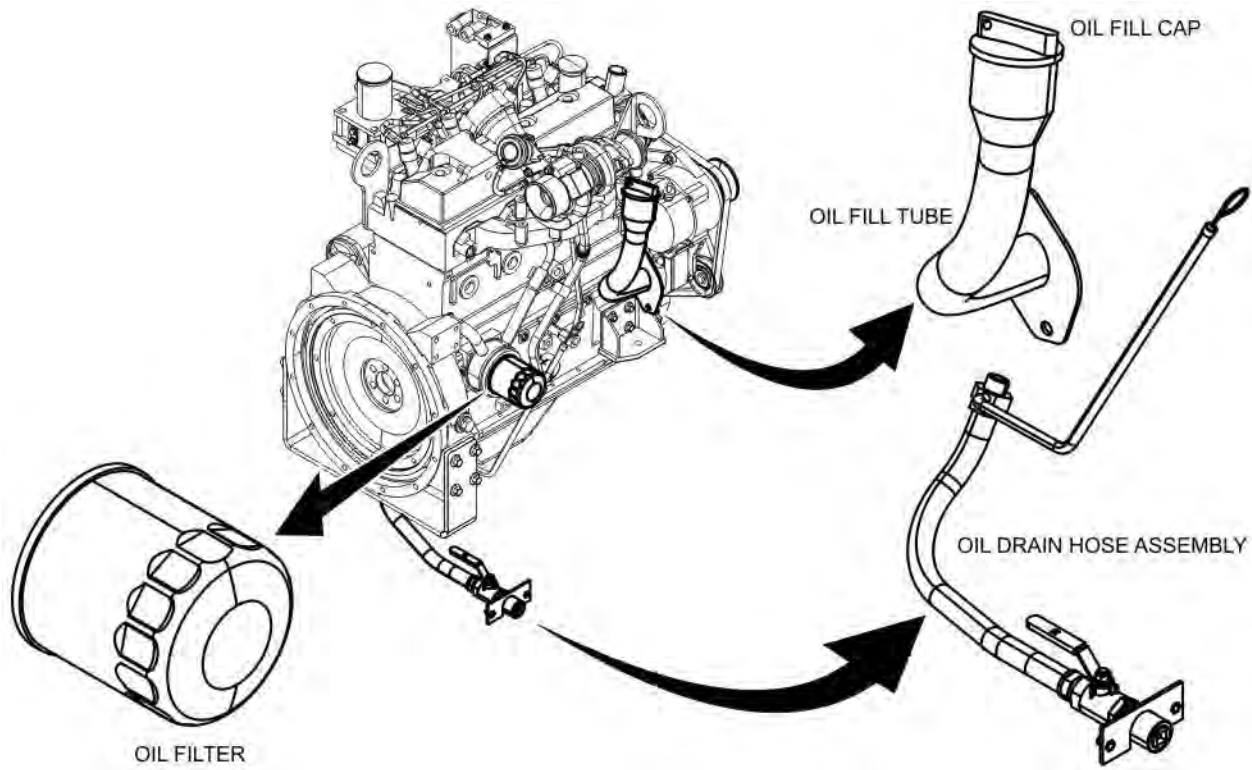
Engine control switch OFF (TM 9-6115-752-10, WP 0005)  
 Engine cool

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**SERVICE LUBRICATION SYSTEM**

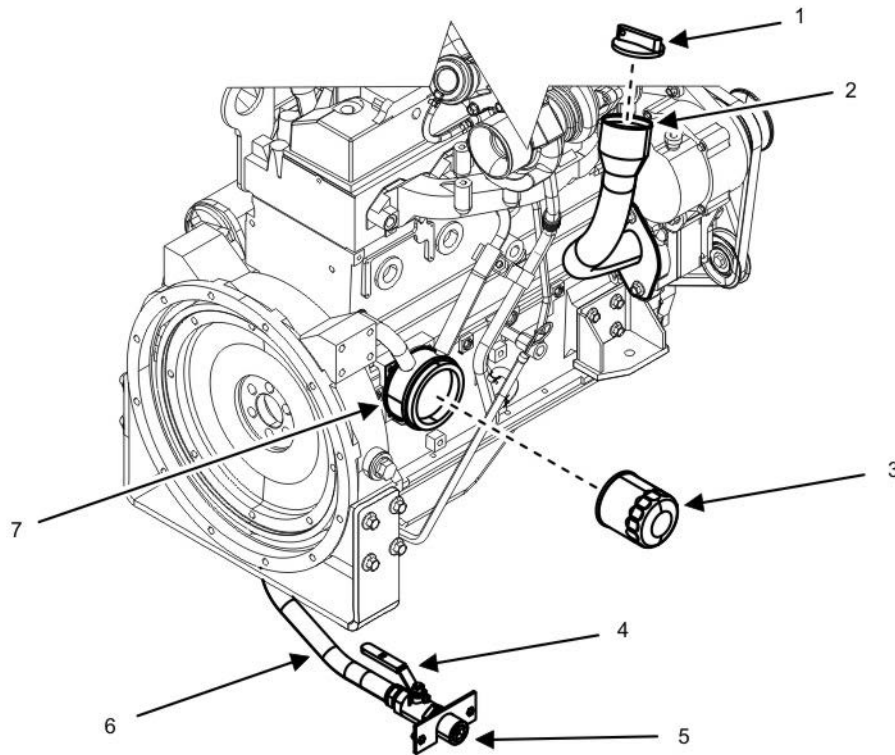
**WARNING**

Allow engine to cool from normal operating temperature prior to draining engine oil and removing oil filter. Failure to comply may cause injury or death to personnel.

**Drain Engine Oil and Remove Oil Filter**

**Figure 1. Oil Fill, Oil Fill Cap, Oil Drain Hose Assembly, and Oil Filter — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
3. Start engine and run for 15 min or until unit has reached normal operating temperature (195°F (90.5°C)) (TM 9-6115-752-10).
4. Turn engine OFF and allow engine to cool for 2 min.
5. Remove battery ground cable (WP 0037, Remove/Install Batteries).
6. Open right-side door and locate the oil fill, oil fill cap, oil drain hose assembly, and oil filter (Figure 1).



**Figure 2. Drain Engine Oil and Remove Oil Filter.**

7. Remove oil fill cap (Figure 2, Item 1) from oil fill tube (Figure 2, Item 2).
8. Place a suitable container under oil drain plug (Figure 2, Item 5) at unit skid to capture drained engine oil.
9. Ensure ball valve (Figure 2, Item 4) of oil drain hose assembly (Figure 2, Item 6) is in the closed position (handle of valve is at 90-degree angle to valve body).
10. Remove oil drain plug (Figure 2, Item 5) from oil drain hose assembly (Figure 2, Item 6).
11. Attach a 5-mm extension pipe to oil drain port to prevent spillage.
12. Open ball valve (Figure 2, Item 4) (handle of valve parallel to valve body) to allow oil to drain into container.
13. Close ball valve (Figure 2, Item 4) (handle of valve at 90-degree angle to valve body) when oil flow has stopped.

### **CAUTION**

Engine oil filter must be changed every time engine oil is drained. Failure to replace engine oil filter when engine oil is changed allows contaminated oil to remain in the engine that may result in damage to internal engine components. Failure to comply may cause damage to equipment.

14. Place a wiping rag under oil filter (Figure 2, Item 3) to capture any residual oil that may spill when oil filter (Figure 2, Item 3) is removed.
15. Turn oil filter (Figure 2, Item 3) counterclockwise using oil filter wrench if necessary to remove oil filter (Figure 2, Item 3) from oil cooler (Figure 2, Item 7).
16. Place oil filter (Figure 2, Item 3) into container to drain.

17. Check oil filter mounting location on oil cooler (Figure 2, Item 7) to ensure oil filter gasket was removed with oil filter (Figure 2, Item 3). If gasket remains, remove gasket from engine. Discard gasket.

## END OF TASK

### Replace Oil Filter and Fill Engine Oil

1. Wipe oil from oil filter mounting location on oil cooler (Figure 2, Item 7) using a clean wiping rag to ensure a good seal with new oil filter (Figure 2, Item 3).

## NOTE

Choose specification oil based on ambient temperature requirements as shown in Table 1.

2. Apply a thin coat of clean engine oil (Table 1) to new gasket on new oil filter (Figure 2, Item 3).
3. Install new oil filter (Figure 2, Item 3) to oil cooler (Figure 2, Item 7) by hand-turning oil filter clockwise onto mounting threads until filter gasket contacts oil cooler (Figure 2, Item 7).
4. Continue to turn oil filter (Figure 2, Item 3) clockwise three-fourths of a turn using oil filter wrench if necessary.
5. Ensure ball valve (Figure 2, Item 4) is in the closed position (handle at 90-degree angle to valve body).
6. Remove 5-mm extension pipe from oil drain hose assembly (Figure 2, Item 6).
7. Install drain plug (Figure 2, Item 5) into oil drain hose assembly (Figure 2, Item 6).

**Table 1. Lubricating Oil.**

SPECIFICATION	RATED TEMPERATURE
MIL-PRF-2104H <sup>a</sup> OE/HDO 15W40	+5°F to +135°F (-15°C to +57°C)
MIL-PRF-2104H OE/HDO-10	-15°F to +5°F (-26°C to -15°C)
MIL-PRF-46167D <sup>b</sup>	-50°F to +40°F (-45°C to +4°C)

<sup>a</sup> Performance Specification, Lubrication Oil, Internal Combustion Engine, Combat/Tactical Service.

<sup>b</sup> Performance Specification, Lubrication Oil, Internal Combustion Engine, Arctic.

## NOTE

Total capacity of lubrication system is 8.5 qt (8.0 L). When replacing engine oil filter, 0.5 qt (0.5 L) will be poured into the new oil filter, and 8.0 qt (7.6 L) of engine oil is required to bring the system to full capacity.

8. Pour required amount of approved engine oil (Table 1) into the oil fill tube (Figure 2, Item 2).
9. Install oil fill cap (Figure 2, Item 1) to oil fill tube (Figure 2, Item 2) and wait 5 min for oil to settle into oil pan.
10. Check engine oil level (TM 9-6115-752-10).
11. Install battery ground cable (WP 0037, Remove/Install Batteries).
12. Close right-side door.
13. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
14. Start engine and run for 5 min (TM 9-6115-752-10).
15. Check for leaks and proper operation. Repair as required.
16. Turn engine OFF and allow engine to cool for 2 min.

17. Check engine oil level (TM 9-6115-752-10). Add oil as required to bring oil to required level.
18. Dispose of captured oil, drained oil filter, and soiled wiping rags IAW local SOP.

## END OF TASK

### Collect Engine Oil Sample

## WARNING

- Wear heat-resistant gloves and avoid contacting hot metal surfaces with hands and exposed skin after components have been heated. Wear additional protective clothing as required. Failure to comply may cause injury or death to personnel.
- High voltage is produced when this generator set is in operation. Do not contact output cables when operating this generator set. Failure to comply may cause injury or death to personnel.

## NOTE

The value of an oil sample is wholly dependent on whether the lubricant has circulated in the component long enough to accumulate and mix wear metal concentrations uniformly.

1. Perform Check Oil Level of Engine Not In Service task or Check Oil Level of Operating Engine task to determine if oil level is adequate to withdraw a sample.
2. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
3. Start and run engine for approximately 5 min to warm and circulate engine oil.

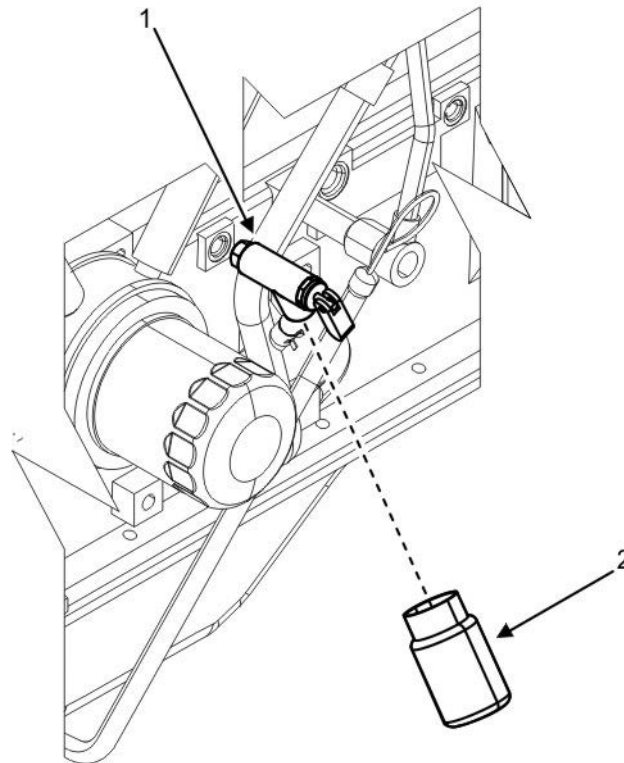


Figure 3. Oil Sample Collection.

4. Open right-side door and locate oil sample collection valve (Figure 3, Item 1).
5. Place a wiping rag under the oil sample collection valve (Figure 3, Item 1) outlet to absorb purge oil.

### CAUTION

Oil that has been trapped within the oil sample collection valve must be purged to prevent a false sample. Engine oil of an operating generator set can reach temperatures in excess of 150°F (65°C) at pressures greater than 80 psi. The time required to open the oil sample collection valve to clear the oil sample collection valve of possible contaminated oil should be momentary. Keeping the oil sample collection valve open for an extended period of time will reduce oil level. Failure to comply may cause damage to equipment.

6. Push toggle of collection valve (Figure 3, Item 1) toward engine to release purge oil, and then release.
7. Wipe outlet of collection valve (Figure 3, Item 1) with a clean rag.
8. Place uncapped oil sample bottle (Figure 3, Item 2) under outlet of collection valve (Figure 3, Item 1).
9. Push toggle of collection valve (Figure 3, Item 1) toward engine and hold until oil is within one-half of an in from sample bottle (Figure 3, Item 2) opening.
10. Cap sample bottle (Figure 3, Item 2).
11. Wipe up any spilled oil and dispose of oil-soaked materials IAW local SOP.
12. Turn engine control switch to OFF position (TM 9-6115-752-10) if generator set was started only to retrieve an oil sample.
13. Perform Check Oil Level of Engine not in Service task or Check Oil Level of Operating Engine task (TM 9-6115-752-10).
14. Record information on oil sample bottle as outlined in TB-43-0211 (AOAP).

### END OF TASK

### END OF WORK PACKAGE

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL OIL DRAIN HOSE ASSEMBLY**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0179, Table 2, Item 39)

**Materials/Parts**

Hose, oil (WP 0137, Repair Parts List, Figure 32, Item 11)

Washer, seal (2) (WP 0137, Repair Parts List, Figure 32, Item 13)

Cap set, protective (WP 0180, Expendable and Durable Items List, Item 8)

Cloth, cleaning, electronics (WP 0180, Item 13)

Lubricating oil, engine (WP 0180, Item 25)

Pan, drain (WP 0180, Item 30)

**Personnel Required**

91D (1)

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

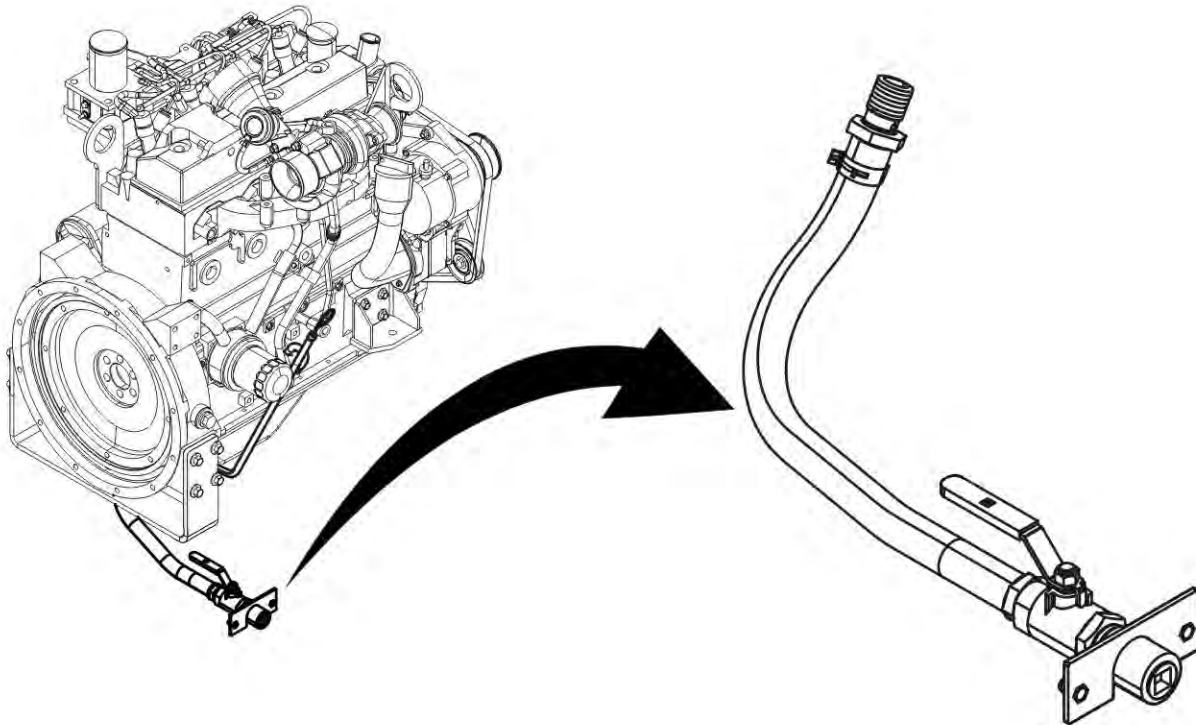
Engine oil drained (WP 0068, Service Lubrication System)

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**REMOVE/INSTALL OIL DRAIN HOSE ASSEMBLY****WARNING**

Allow engine to cool from normal operating temperature prior to draining engine oil and removing oil filter. Failure to comply may cause injury or death to personnel.

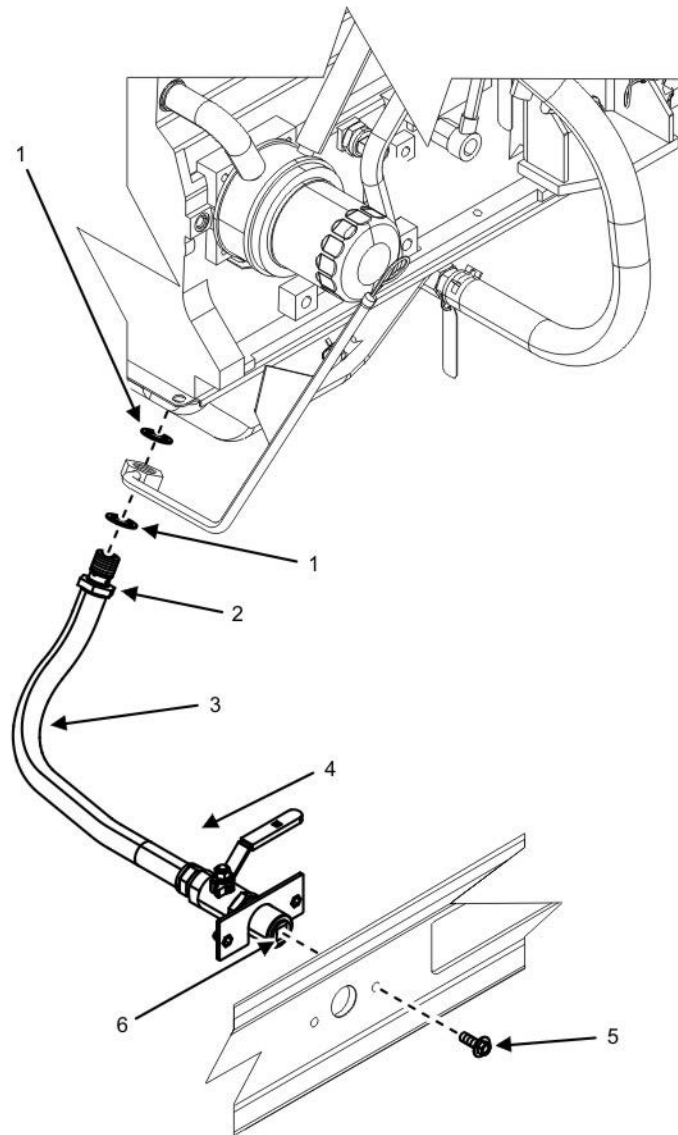
## Remove Oil Drain Hose Assembly



**Figure 1. Oil Drain Hose — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door and locate engine oil drain hose assembly (Figure 1).





**Figure 2. Engine Oil Drain Hose — Removal.**

### **CAUTION**

Cap/plug all open oil fittings and hoses to prevent contamination from entering the lubrication system. Failure to comply may cause damage to equipment.

3. Remove two screws (Figure 2, Item 5) that secure engine oil drain hose assembly to unit skid.
4. Place wiping rags under engine oil drain hose assembly to capture spilled oil.
5. Remove banjo adapter (Figure 2, Item 2) and two sealing washers (Figure 2, Item 1) from engine oil pan. Discard sealing washers (Figure 2, Item 1).
6. Cap/plug open end of engine oil drain hose assembly and open port in engine oil pan.
7. Remove engine oil drain hose assembly from generator set and place on a suitable work surface.

**END OF TASK**

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**Inspect Oil Drain Hose**

1. Inspect oil drain hose (Figure 2, Item 3) for cuts, kinks, or other obvious damage.
2. Replace oil drain hose (Figure 2, Item 3) if cut, torn, or otherwise damaged.
3. Inspect ball valve (Figure 2, Item 4) for smooth operation and other signs of obvious damage.
4. Replace ball valve (Figure 2, Item 4) if operation is stiff or if otherwise damaged.

**END OF TASK****Install Oil Drain Hose**

1. Apply thread sealing compound to all pipe threads during installation.
2. Install ball valve (Figure 2, Item 4) to oil drain hose (Figure 2, Item 3) if separated during inspection.
3. Position engine oil drain hose assembly to mounting location in unit skid.
4. Install two new sealing washers (Figure 2, Item 1) onto banjo adapter (Figure 2, Item 2), one on either side of dipstick tube fitting.
5. Install banjo adapter (Figure 2, Item 2) into engine oil pan.
6. Ensure engine oil drain hose assembly lies flat inside unit skid and is not kinked.
7. Secure engine oil drain hose assembly to unit skid by installing two screws (Figure 2, Item 5).
8. Torque two screws (Figure 2, Item 5) to 7 – 8 ft/lb (10 – 12 Nm).
9. Install drain plug (Figure 2, Item 6) to engine oil drain hose assembly if removed during this procedure.
10. Ensure ball valve (Figure 2, Item 4) is in the closed position (handle of valve at 90 degree angle to valve body).
11. Fill engine oil (WP 0068, Service Lubrication System).
12. Close right-side door.
11. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
12. Start engine and check for proper operation (TM 9-6115-752-10).
13. Dispose of capture oil and soiled rags IAW local SOP.
14. Repair as required.

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL COALESCER**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Element, coalescer (WP 0139, Repair Parts List, Figure 34, Item 26)

Filter, breather coalescer (WP 0139, Figure 34, Item 25)

Detergent, general purpose (WP 0180, Expendable and Durable Items List, Item 18)

Grease, electrically conductive (WP 0180, Item 22)

Rag, wiping (WP 0180, Item 33)

**Personnel Required**

91D (1)

Assistant (1)

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

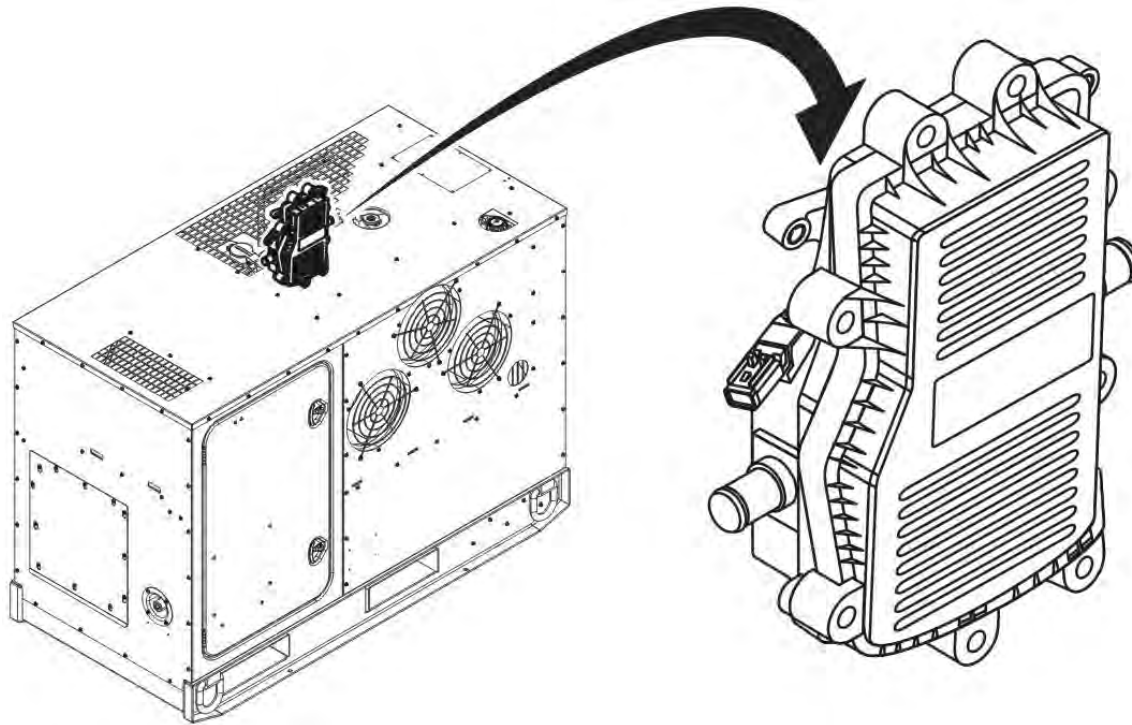
Top body panel removed (WP 0029, Remove/Install Top Body Panel)

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**REMOVE/INSTALL COALESCER****WARNING**

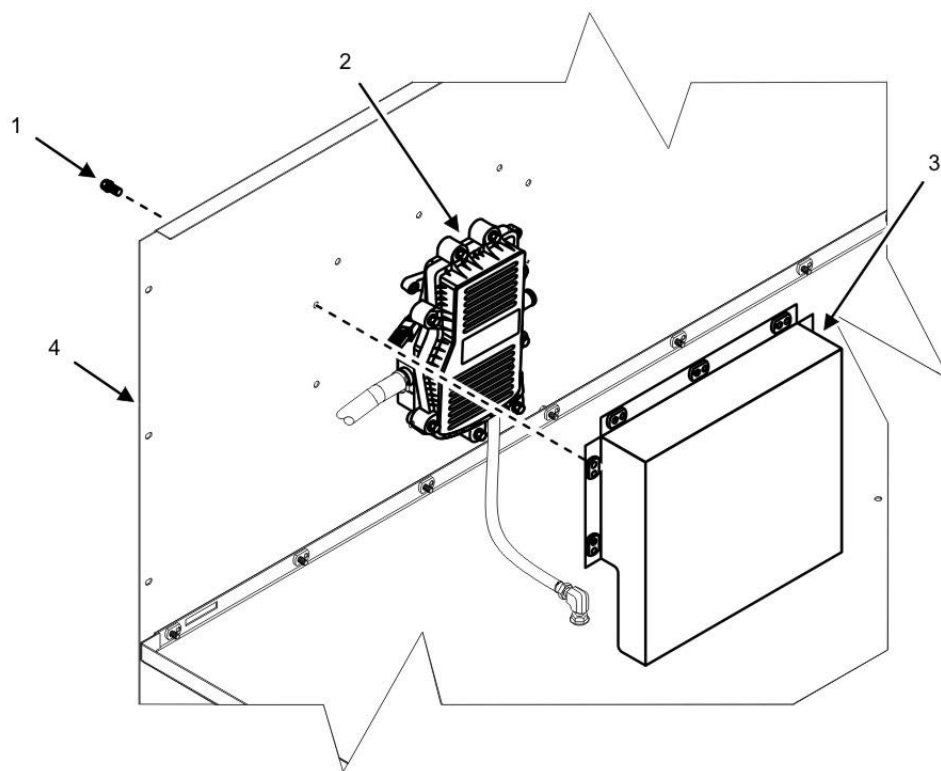
- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.

## Remove Coalescer Unit



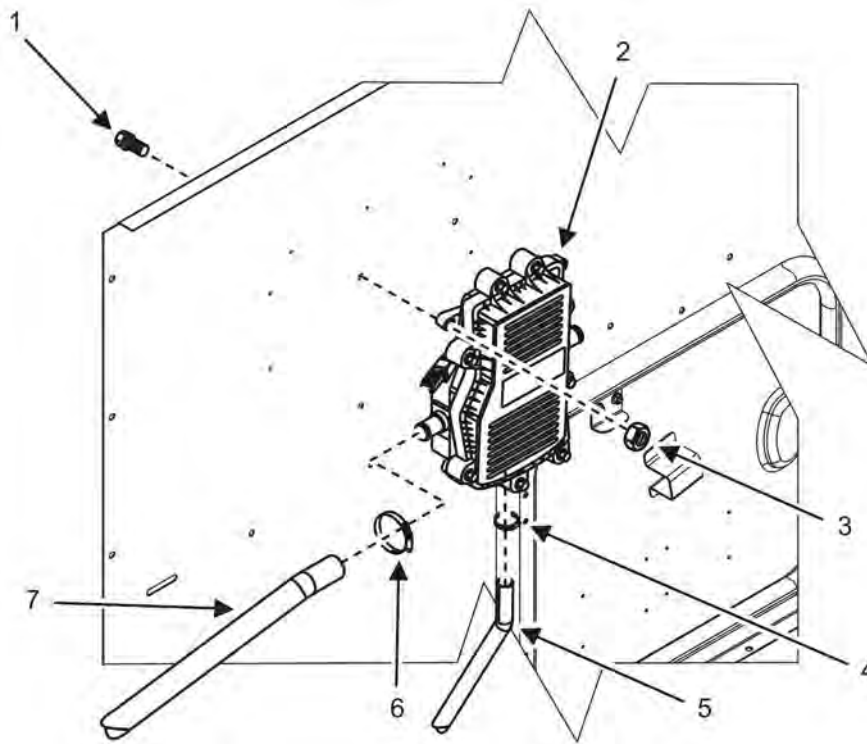
**Figure 1. Coalescer — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Look into generator set from top and locate coalescer (Figure 1).



**Figure 2. Coalescer Cover — Removal.**

3. Remove seven screws (Figure 2, Item 1) securing coalescer cover (Figure 2, Item 3) to right-side body panel (Figure 2, Item 4).
4. Remove coalescer cover (Figure 2, Item 3) to expose coalescer (Figure 2, Item 2).
5. Set coalescer cover (Figure 2, Item 3) aside for reuse.



**Figure 3. Coalescer — Removal.**

6. Remove four flange bolts (Figure 3, Item 1) and four nuts (Figure 3, Item 3) securing coalescer (Figure 3, Item 2) to right-side body panel.
7. Reposition hose clamp (Figure 3, Item 6) on coalescer supply hose (Figure 3, Item 7) and remove supply hose (Figure 3, Item 7) from coalescer (Figure 3, Item 2).
8. Reposition hose clamp (Figure 3, Item 4) on coalescer return hose (Figure 3, Item 5) and remove return hose (Figure 3, Item 5) from coalescer (Figure 3, Item 2).

### **CAUTION**

Radiator and charge air cooler have delicate cooling fins. Use care not to damage cooling fins when removing the coalescer. Failure to comply may cause damage to equipment.

9. Remove coalescer (Figure 3, Item 2) from generator set and place on a suitable work surface.

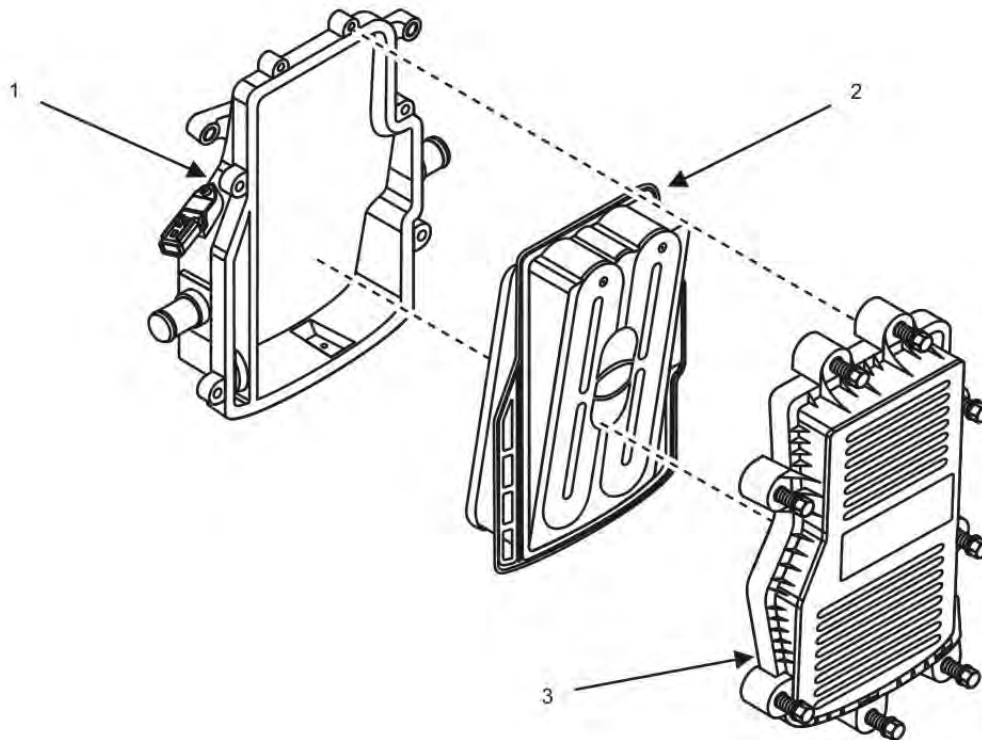
### **END OF TASK**

#### **Inspect Coalescer**

1. Inspect coalescer (Figure 3, Item 2) for signs of obvious damage.
2. Replace coalescer (Figure 3, Item 2) if damaged.
3. Inspect coalescer supply and return hoses (Figure 3, Items 7 and 5) and clamps (Figure 3, Items 6 and 4) for signs of obvious damage. Replace damaged components as required.

### **END OF TASK**

## Replace Coalescer Filter Element



**Figure 4. Replace Coalescer Filter Element.**

1. Loosen eight captive screws that secure coalescer cover (Figure 4, Item 3) to coalescer case (Figure 4, Item 1).
2. Remove coalescer cover (Figure 4, Item 3) to expose coalescer filter element (Figure 4, Item 2).
3. Replace coalescer (Figure 3, Item 2) if captive screws are damaged or missing.
4. Remove coalescer filter element (Figure 4, Item 2) and inspect for dirt and damage.
5. Replace coalescer filter element (Figure 4, Item 2) if dirty or damaged.

### WARNING

Water solution hot enough to clean engine parts is hot enough to cause scald injury to personnel. Be sure to wear protective clothing, gloves, and goggles while cleaning pistons. Failure to comply may cause injury or death to personnel.

6. Clean coalescer case (Figure 4, Item 1) and coalescer cover (Figure 4, Item 3) in a solution of hot water and detergent.
7. Dry coalescer case (Figure 4, Item 1) and coalescer cover (Figure 4, Item 3) with wiping rags.
8. Place new coalescer filter element (Figure 4, Item 2) in coalescer case (Figure 4, Item 1) and install coalescer cover (Figure 4, Item 3).
9. Tighten eight captive screws to secure coalescer cover (Figure 4, Item 3) to coalescer case (Figure 4, Item 1).

**END OF TASK**

**Install Coalescer**

1. Place coalescer (Figure 3, Item 2) inside generator set right-side body panel (Figure 2, Item 4).
2. Install coalescer return hose (Figure 3, Item 5) to bottom of coalescer (Figure 3, Item 2) and secure by installing hose clamp (Figure 3, Item 4).
3. Install coalescer supply hose (Figure 3, Item 7) to coalescer (Figure 3, Item 2) and secure by installing hose clamp (Figure 3, Item 6).
4. Position coalescer (Figure 2, Item 2) to mounting location on right-side body panel and secure by installing four flange bolts (Figure 3, Item 1) and four nuts (Figure 3, Item 3).
5. Position coalescer cover (Figure 2, Item 3) on right-side body panel (Figure 2, Item 4), and align mounting holes.
6. Secure coalescer cover (Figure 2, Item 3) by installing seven screws (Figure 2, Item 1) to right-side body panel (Figure 2, Item 4).
7. Install top body panel (WP 0029, Remove/Install Top Body Panel).
8. Install battery ground cable (WP 0037, Remove/Install Batteries).
9. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
10. Start engine and check for proper operation (TM 9-6115-752-10).
11. Repair as required.

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL OIL COOLER**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)  
Wrench, Oil Filter, Strap (WP 0179, Table 2, Item 37)  
Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0179, Table 2, Item 39)

**Materials/Parts**

Cooler, oil (1) (WP 0138, Repairs Parts List, Figure 33, Item 6)  
Element, lubricating oil filter (1) (WP 0136, Repair Parts List, Figure 31, Item 12)  
Antifreeze, ethylene glycol (WP 0180, Expendable and Durable Items List, Item 2)  
Cap set, protective (WP 0180, Item 8)  
Cloth, cleaning, electronics (WP 0180, Item 13)  
Lubricating oil, engine (WP 0180, Item 25)  
Pan, drain (WP 0180, Item 30)  
Rag, wiping (WP 0180, Item 33)

**Personnel Required**

91D (1)

**References**

WP 0022, Service Cooling System

**Equipment Conditions**

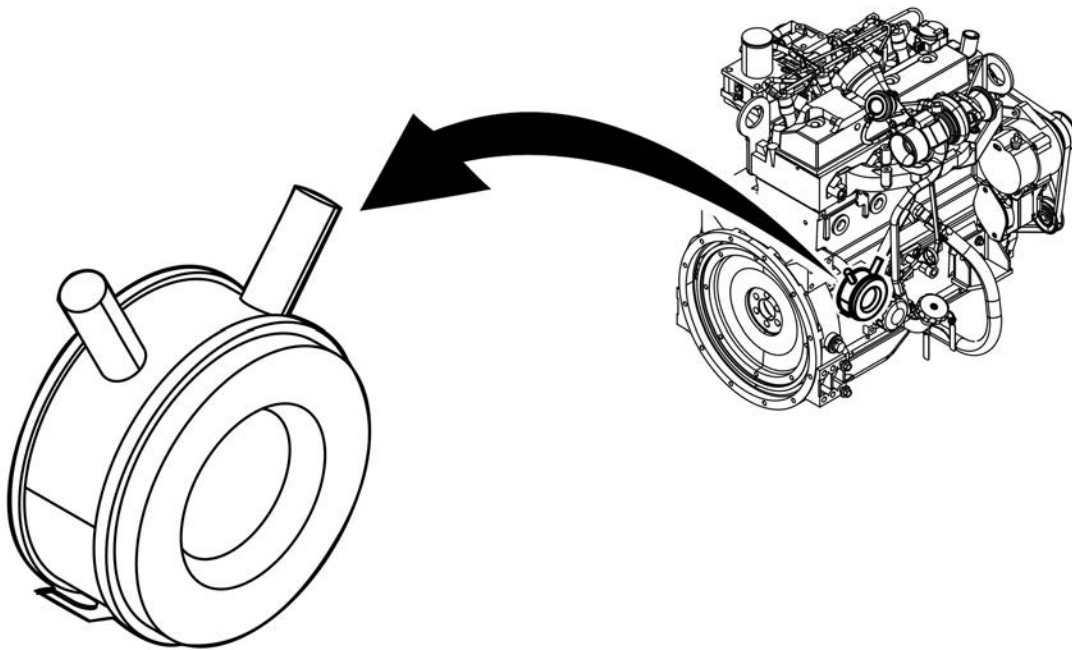
Engine control switch OFF (TM 9-6115-752-10, WP 0005)  
Engine cool  
Oil filter removed and engine oil drained (WP 0068, Service Lubrication System)

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**SERVICE LUBRICATION SYSTEM****WARNING**

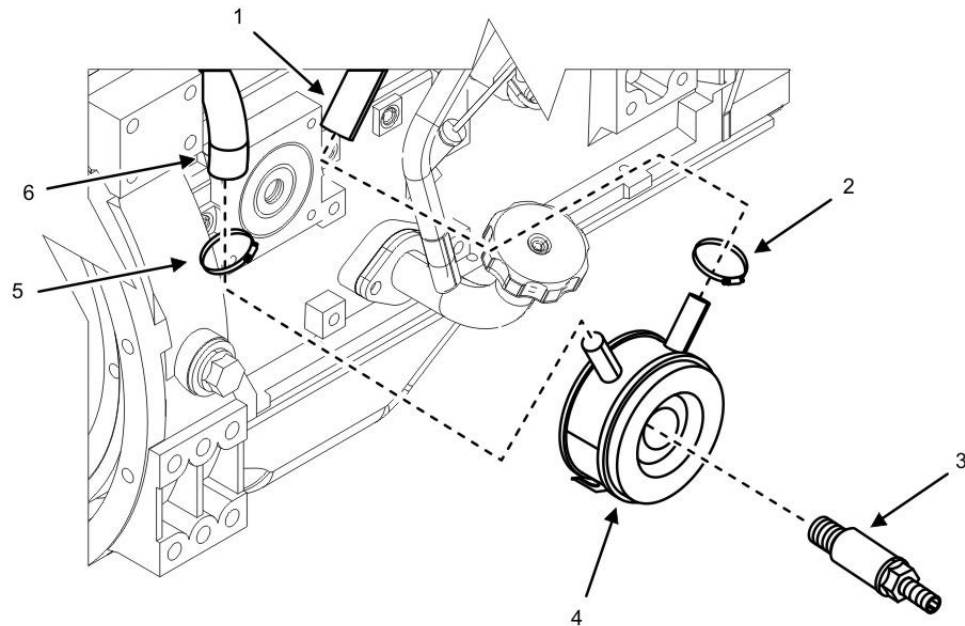
Allow engine to cool from normal operating temperature prior to draining engine oil and removing oil filter. Failure to comply may cause injury or death to personnel.

## Remove Engine Oil Cooler



**Figure 1. Engine Oil Cooler — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door and locate oil cooler (Figure 1).



**Figure 2. Engine Oil Cooler — Removal.**

3. Place a suitable container under oil cooler (Figure 2, Item 4) to capture spilled coolant.

### **NOTE**

Immediately after removing the supply and return hose from the oil cooler, cap/plug the open ends of the hoses and oil cooler to minimize the loss of coolant and to prevent contaminants from entering the cooling system.

4. Loosen clamp (Figure 2, Item 5) securing supply hose (Figure 2, Item 6) to oil cooler (Figure 2, Item 4).
5. Remove supply hose (Figure 2, Item 6) from oil cooler (Figure 2, Item 4).
6. Loosen clamp (Figure 2, Item 2) securing return hose (Figure 2, Item 1) to oil cooler (Figure 2, Item 4).
7. Remove return hose (Figure 2, Item 1) from oil cooler (Figure 2, Item 4).
8. Remove oil filter threaded core (Figure 2, Item 3).
9. Remove oil cooler (Figure 2, Item 4) from engine and place on a suitable work surface.

### **END OF TASK**

#### **Inspect Oil Cooler**

1. Inspect oil cooler (Figure 2, Item 4) for cracks, dents, and other signs of obvious damage.
2. Replace oil cooler (Figure 2, Item 4) if cracked, dented, or otherwise damaged.
3. Inspect supply and return hoses (Figure 2, Items 6 and 1) for cracks, splits, and other signs of obvious damage.
4. Replace supply and return hoses (Figure 2, Items 6 and 1) if cracked, split, or otherwise damaged.

### **END OF TASK**

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**Install Oil Cooler**

1. Position oil cooler (Figure 2, Item 4) to its mounting position on engine.
2. Secure oil cooler (Figure 2, Item 4) to engine by installing oil filter threaded core (Figure 2, Item 3). Torque oil filter threaded core (Figure 2, Item 3) to 58 ft/lb (79 Nm).
3. Remove caps/plugs from return hose (Figure 2, Item 1) and return port of oil cooler (Figure 2, Item 4).
4. Install return hose (Figure 2, Item 1) to oil cooler (Figure 2, Item 4).
5. Position and tighten clamp (Figure 2, Item 2) to secure return hose (Figure 2, Item 1) to oil cooler (Figure 2, Item 4).
6. Remove caps/plugs from supply hose (Figure 2, Item 6) and supply port of oil cooler (Figure 2, Item 4).
7. Install supply hose (Figure 2, Item 6) to oil cooler (Figure 2, Item 4).
8. Position and tighten clamp (Figure 2, Item 5) to secure supply hose (Figure 2, Item 6) to oil cooler (Figure 2, Item 4).
9. Install oil filter and fill engine oil (WP 0068, Service Lubrication System).
10. Start engine and check for oil and coolant leaks (TM 9-6115-752-10). Repair as required.
11. Turn engine control switch to OFF (TM 9-6115-752-10).
12. Check coolant level (TM 9-6115-752-10).
13. Fill cooling system as required (WP 0022, Service Cooling System).
14. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
15. Start engine and check for proper operation (TM 9-6115-752-10).
16. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL SPIN-ON FUEL FILTER ASSEMBLY**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)  
Wrench, Oil Filter, Strap (WP 0179, Table 2, Item 37)

**Materials/Parts**

Element, fuel filter (1) (WP 0144, Repair Parts List, Figure 39, Item 5)  
Washer, sealing (M14) (2) (WP 0143, Repair Parts List, Figure 38, Item 17)  
Fuel, diesel (WP 0180, Expendable and Durable Items List, Item 21)  
Grease, electrically conductive (WP 0180, Item 22)  
Pan, drain (WP 0180, Item 30)  
Rag, wiping (WP 0180, Item 33)

**Personnel Required**

91D (1)

**Equipment Conditions**

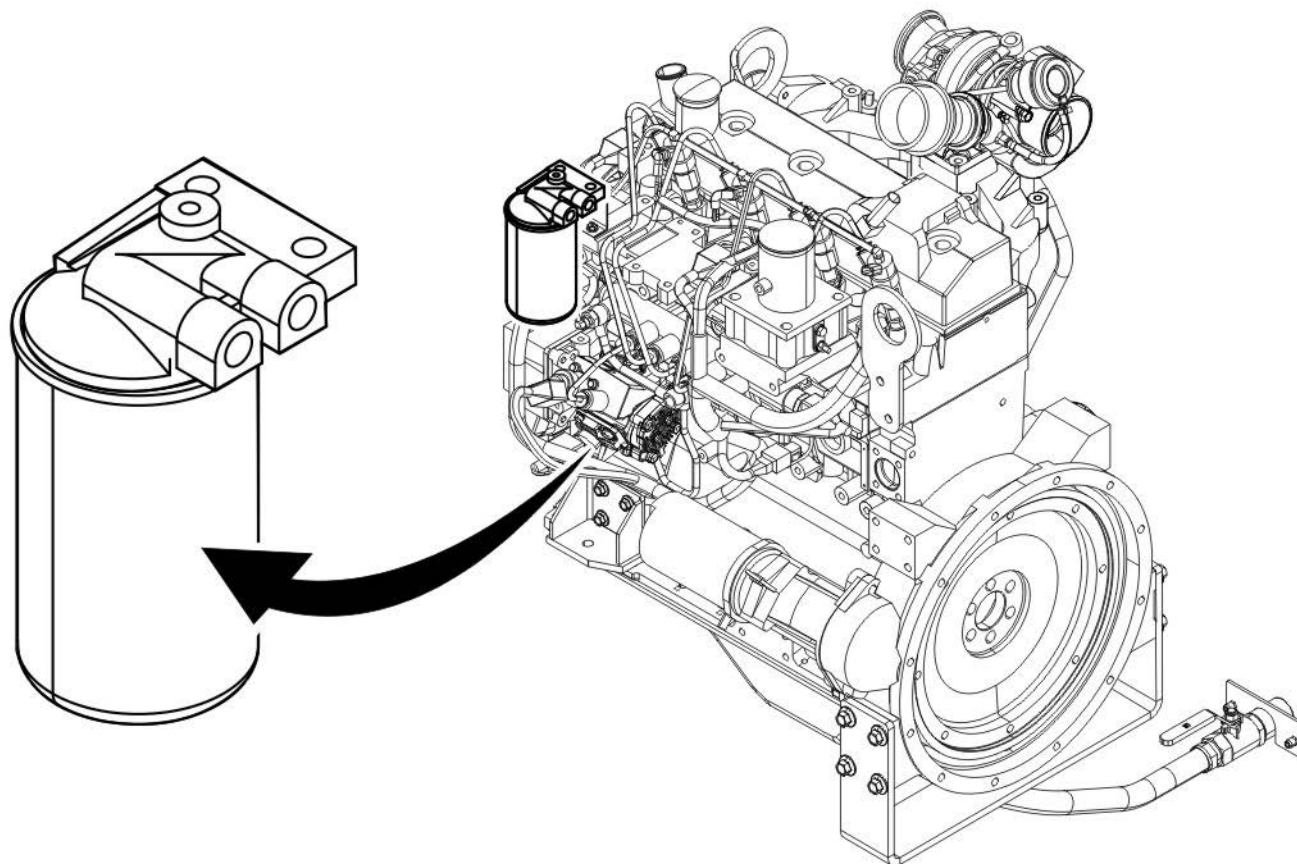
Engine control switch OFF (TM 9-6115-752-10, WP 0005)  
Engine cool  
Battery ground cable removed (WP 0037, Remove/Install Batteries)

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**REMOVE/INSTALL SPIN-ON FUEL FILTER ASSEMBLY****WARNING**

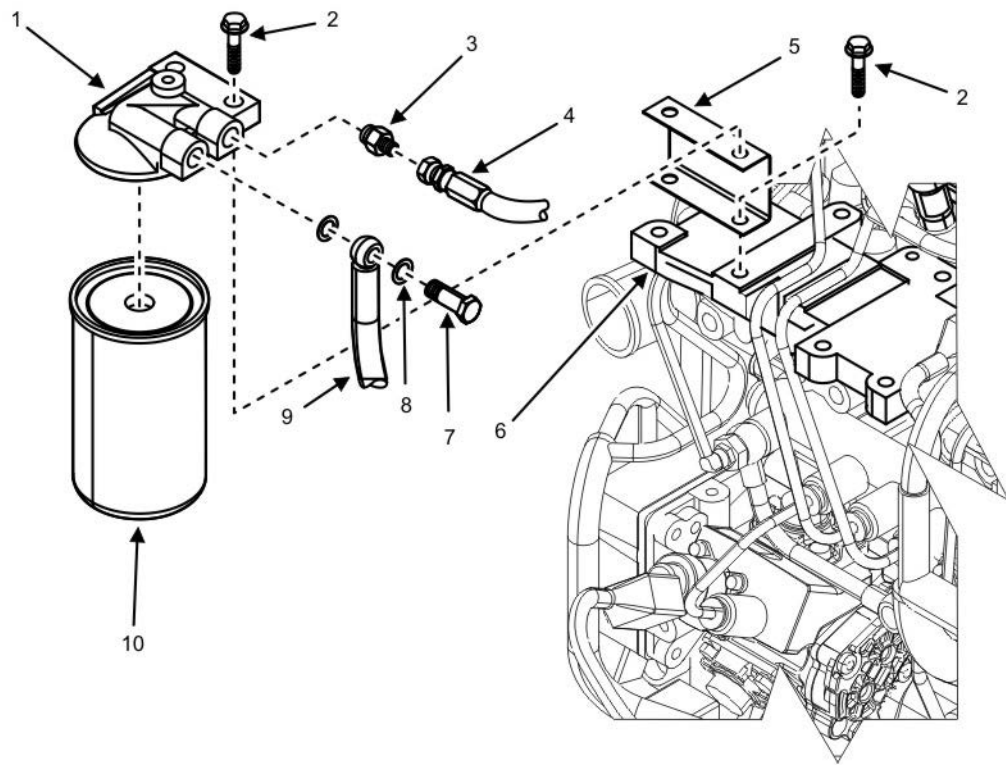
Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

## Remove Fuel Filter Head



**Figure 1. Spin-On Fuel Filter — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door of generator set and locate spin-on fuel filter assembly (Figure 1).



**Figure 2. Spin-On Fuel Filter — Detail.**

3. Remove spin-on fuel filter element (Figure 2, Item 10) from fuel filter head (Figure 2, Item 1). See Replace Spin-On Fuel Filter Element task.

### CAUTION

To prevent contamination from entering the fuel system, cap/plug all open fuel lines and ports. Failure to comply may cause damage to equipment.

### NOTE

Tag or mark fuel hoses during removal to aid at installation.

4. Place wiping rags and drain pan under fuel filter head (Figure 2, Item 1) to capture spilled fuel when fuel lines (Figure 2, Items 4 and 9) are removed.
5. Tag and remove fuel input hose (Figure 2, Item 9) from fuel filter head (Figure 2, Item 1) by removing banjo bolt (Figure 2, Item 7) and two sealing washers (Figure 2, Item 8). Discard sealing washers (Figure 2, Item 8).
6. Tag and remove fuel output hose (Figure 2, Item 4) from connector (Figure 2, Item 3).
7. Remove elbow connector (Figure 2, Item 3) from output port of fuel filter head (Figure 2, Item 1).
8. Cap/plug all open fuel hoses and ports.

9. Remove two mounting bolts (Figure 2, Item 2) securing fuel filter head (Figure 2, Item 1) to mounting bracket (Figure 2, Item 5).
10. Remove fuel filter head (Figure 2, Item 1) from mounting bracket (Figure 2, Item 5) and place on suitable work surface.

## END OF TASK

### Inspect Fuel Filter Head

1. Inspect fuel filter head (Figure 2, Item 1) for cracks, passage blockage, and material or debris on sealing surface.
2. Clear blocked passages and remove material or debris from sealing surface of fuel filter head (Figure 2, Item 1).
3. Discard fuel filter head (Figure 2, Item 1) if cracked or damaged.
4. Inspect mounting bracket (Figure 2, Item 5) for cracks, bends or other signs of obvious damage.
5. Replace damaged mounting bracket (Figure 2, Item 5) by removing two mounting bolts (Figure 2, Item 2) and removing mounting bracket (Figure 2, Item 5) from intake manifold (Figure 2, Item 6).

## END OF TASK

### Install Fuel Filter Head

## NOTE

Wipe hoses, parts, and connectors with wiping rag prior to installation.

1. Install mounting bracket (Figure 2, Item 5) to intake manifold (Figure 2, Item 6) if removed during inspection process, by installing two bolts (Figure 2, Item 2)
2. Position fuel filter head (Figure 2, Item 1) to its mounting location on mounting bracket (Figure 2, Item 5) and align mounting holes.
3. Install two mounting bolts (Figure 2, Item 2) to secure filter head (Figure 2, Item 1) to mounting bracket (Figure 2, Item 5). Tighten bolts (Figure 2, Item 2) to 34 – 42 ft/lb (47 – 57Nm).
4. Place wiping rags under fuel filter head (Figure 2, Item 1) to capture spilled fuel when fuel lines are installed.

## NOTE

Wipe hoses, parts, and connectors with wiping rag prior to installation.

Prior to assembly, apply sealant to all pipe thread fittings and connectors.

5. Install elbow connector (Figure 2, Item 3) into output port on fuel filter head (Figure 2, Item 1).
6. Remove caps/plugs and connect fuel output hose (Figure 2, Item 4) to elbow connector (Figure 2, Item 3) and secure.
7. Remove caps/plugs and position fuel input hose (Figure 2 Item 9) to fuel filter head (Figure 2, Item 1) input port.
8. Install banjo bolt (Figure 2, Item 7) and two new sealing washers (Figure 2, Item 8) to secure fuel input hose (Figure 2 Item 9) to fuel filter head (Figure 2 Item 1).
9. Install spin-on fuel filter element (Figure 2, Item 10) to fuel filter head (Figure 2, Item 1). See Replace Spin-On Fuel Filter Element task.
10. Dispose of captured fuel and soiled rags IAW local SOP.



11. Close left-side door of generator set.
12. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
13. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
14. Start engine and check for leaks and proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
15. Repair as required.

## END OF TASK

### Replace Spin-on Fuel Filter Element

#### CAUTION

Dirt and debris can contaminate the fuel system. Cap/plug all open fuel lines and ports to prevent contamination from entering the fuel system. Failure to comply may cause damage to equipment.

1. Open left-side door of generator set and locate spin-on fuel filter element (Figure 1).
2. Place wiping rags and drain pan under spin-on filter element (Figure 2, Item 10) to capture spilled fuel when spin-on fuel filter element (Figure 2, Item 10) is removed.
3. Remove spin-on fuel filter element (Figure 2, Item 10) from fuel filter head (Figure 2, Item 1) using a fuel filter wrench.
4. Drain fuel from spin-on fuel filter element (Figure 2, Item 10) into drain pan and discard spin-on fuel filter element.
5. Fill new spin-on fuel filter element (Figure 2, Item 10) with approved fuel.
6. Apply a thin film of clean, approved fuel to seal of new spin-on fuel filter element (Figure 2, Item 10).
7. Install spin-on fuel filter element (Figure 2, Item 10) to fuel filter head (Figure 2, Item 1) until seal of element contacts fuel filter head.

#### CAUTION

Mechanical over-tightening will distort the threads on the filter element seal or filter can. Do not over-tighten filter element. Failure to comply may cause damage to equipment.

8. Tighten spin-on fuel filter element (Figure 2, Item 10) by turning element an additional 1/4 turn after seal contacts fuel filter head (Figure 2, Item 1).
9. Dispose of captured fuel and soiled rags IAW local SOP.
10. Close left-side door.
11. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
12. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
13. Start engine and check for leaks and proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
14. Repair as required.

## END OF TASK

## END OF WORK PACKAGE



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL FUEL RAIL**

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**INITIAL SETUP:****Test Equipment**

Hose, Fuel Return Flow (WP 0179, Table 2, Item 13)

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Rail, fuel (WP 0143, Repair Parts List, Figure 38, Item 3)

Washer, sealing (2) (WP 0143, Figure 38, Item 24)

Washer, sealing (M14) (7) (WP 0143, Figure 38, Item 17)

Cap set, protective (WP 0180, Expendable and Durable Items List, Item 8)

Rag, wiping (WP 0180, Item 33)

Sealant (WP 0180, Item 34)

Tag, marker (WP 0180, Item 37)

**Personnel Required**

91D (1)

**References**

WP 0074, Test/Replace Fuel Injector

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**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Top body panel removed (WP 0029, Remove/Install Top Body Panel)

Left-side door panel removed (WP 0032, Remove/Install Left-Side Body Panel)

Spin-on fuel filter assembly cartridge removed (WP 0072, Remove/Install Spin-On Fuel Filter Assembly)

Fuel injector high-pressure supply lines removed (WP 0074, Test/Replace Fuel Injectors)

Fuel injector drain line removed from banjo bolt adapter, high-pressure fuel pump upper drain line removed from fuel rail, and high-pressure fuel pump high-pressure supply line removed (WP 0075, Remove/Install High-Pressure Fuel Pump)

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**REMOVE/INSTALL FUEL RAIL**

## Remove Fuel Rail

### WARNING

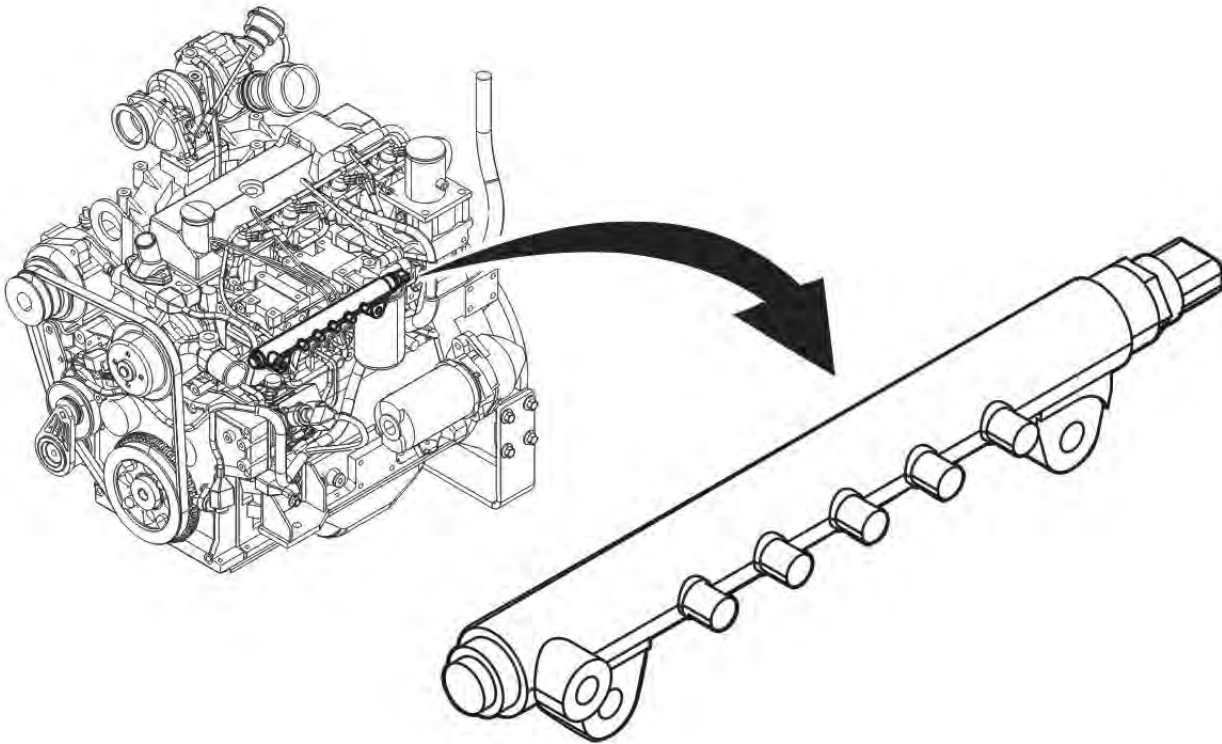
Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

### CAUTION

Cap/plug all open fuel lines and ports to prevent contamination from entering the fuel system. Failure to comply may cause damage to equipment.

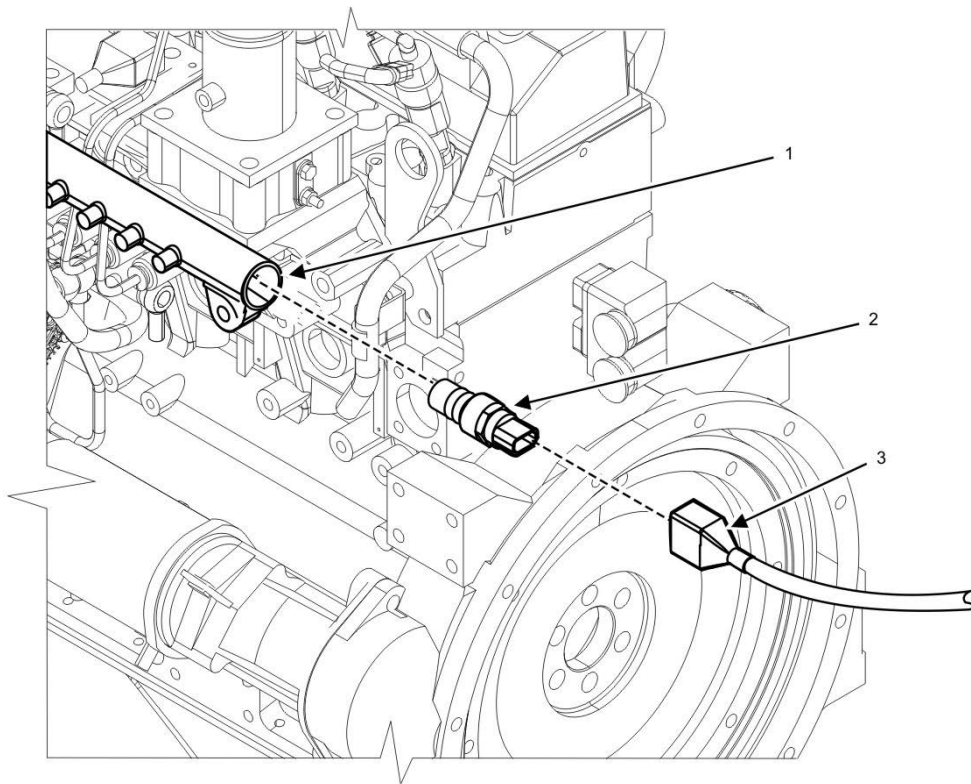
### NOTE

To minimize contamination of fuel system, clean the area around the fuel rail prior to performing any repair steps.



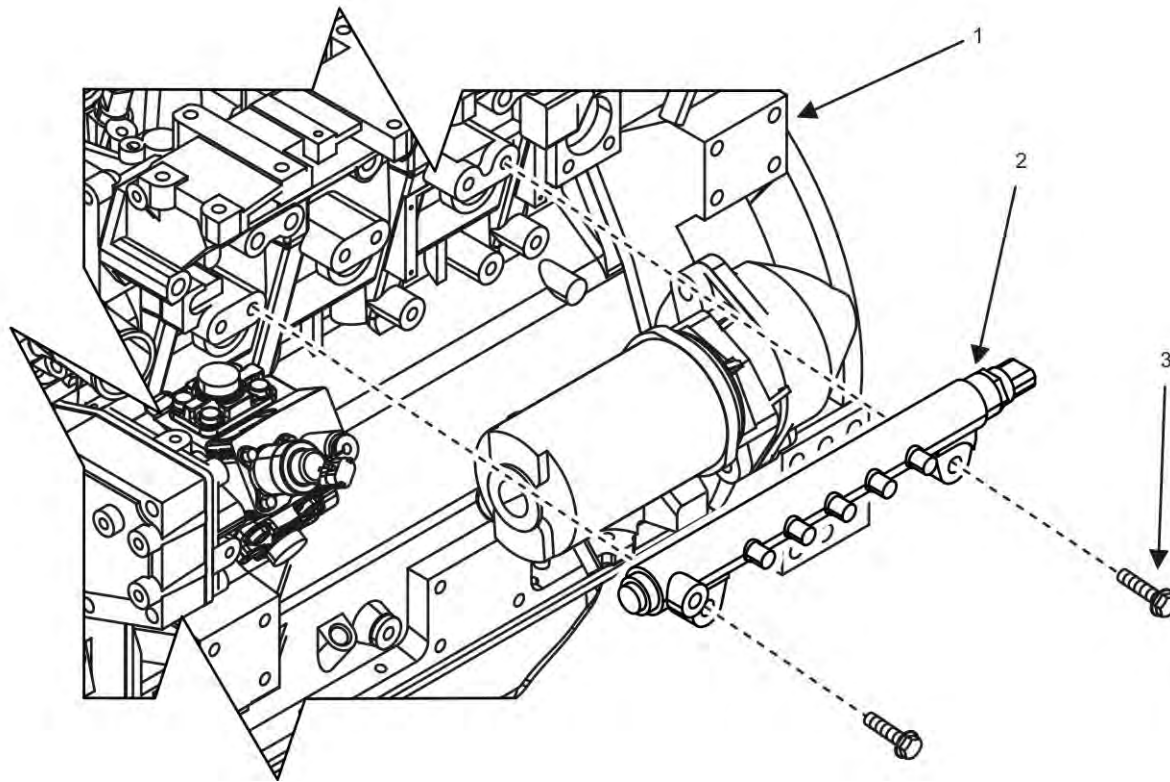
**Figure 1. Fuel Rail — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door and locate fuel rail (Figure 1).
3. Tag all components, electrical wires, connectors, and fuel lines prior to removal to aid at installation.



**Figure 2. Fuel Rail — Pressure Sensor.**

4. Disconnect electrical connector (Figure 2, Item 3) from fuel rail pressure sensor (Figure 2, Item 2) on right-hand side of fuel rail (Figure 2, Item 1).



**Figure 3. Fuel Rail — Removal.**

5. Remove two screws (Figure 3, Item 3) securing fuel rail (Figure 3, Item 2) to engine (Figure 3, Item 1).
6. Remove fuel rail (Figure 3, Item 2) from engine (Figure 3, Item 1) and place on a suitable work surface.
7. Remove fuel rail pressure sensor (Figure 3, Item 2) from right-hand side of fuel rail (Figure 2, Item 1).

**END OF TASK**

**Inspect Fuel Rail**

1. Inspect fuel rail (Figure 3, Item 2) sealing surfaces for cracks and scratches.
2. Inspect fuel rail (Figure 3, Item 2) threaded ports for damage or cracks.
3. Replace fuel rail (Figure 3, Item 2) if sealing surfaces or threaded surfaces are damaged.

**END OF TASK**

**Install Fuel Rail**

1. Apply thread sealant to threads of pressure sensor (Figure 2, Item 2).
2. Install pressure sensor (Figure 2, Item 2) into right-hand side of fuel rail (Figure 2, Item 1) and tighten.
3. Position fuel rail (Figure 3, Item 2) to its mounting location on engine (Figure 3, Item 1) and align mounting holes. Ensure proper orientation.
4. Install two screws (Figure 3, Item 3) and secure fuel rail (Figure 3, Item 2) to engine (Figure 3, Item 1).
5. Connect electrical connector (Figure 2, Item 3) to pressure sensor (Figure 2, Item 2) connector on right-hand side of fuel rail (Figure 2, Item 1). Install protective boot and secure.

- 
6. Connect high-pressure fuel lines (not shown) from fuel injectors (not shown) to fuel rail (Figure 3, Item 2) (WP 0074, Test/Replace Fuel Injectors).
  7. Install high-pressure fuel pump upper drain line (not shown) to fuel rail (Figure 3, Item 2) drain port (WP 0075, Remove/Install High-Pressure Fuel Pump).
  8. Connect fuel injector drain line (not shown) to banjo bolt adapter (not shown) on fuel rail (Figure 3, Item 2) drain port (WP 0075, Remove/Install High-Pressure Fuel Pump).
  9. Install high-pressure supply line (not shown) from fuel pump (not shown) to fuel rail (Figure 3, Item 2) (WP 0075, Remove/Install High-Pressure Fuel Pump).
  10. Install spin-on fuel filter assembly cartridge (WP 0072, Remove/Install Spin-On Fuel Filter Assembly).
  11. Install left-side door panel (WP 0032, Remove/Install Left-Side Body Panel).
  12. Install top body panel (WP 0029, Remove/Install Top Body Panel).
  13. Install battery ground cable (WP 0037, Remove/Install Batteries).
  14. Close left-side door.

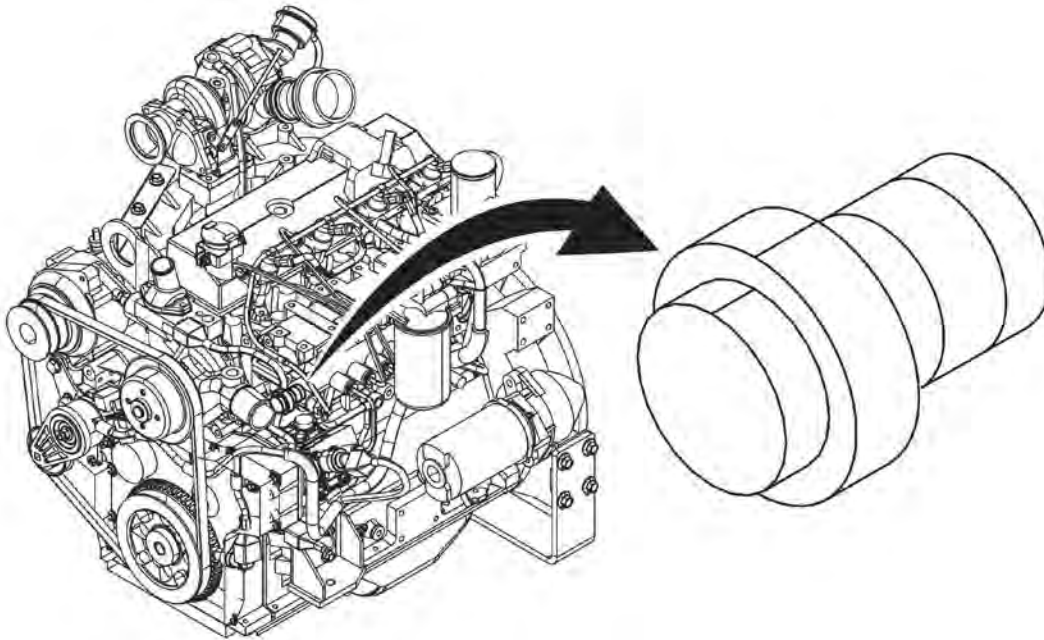
### NOTE

Clean components, wires, connectors, fuel lines, and ports with clean wiping rag prior to starting operational checkout.

15. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
16. Start engine and check for proper operation and leaks (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
17. Repair as required.
18. Dispose of captured fluids and soiled rags IAW local SOP.

### END OF TASK

## Test Fuel Pressure Relief Valve



**Figure 4. Fuel Pressure Relief Valve — Location.**

1. Ensure engine control switch is OFF and engine is cool (TM 9-6115-752-10).
2. Remove battery ground cable (WP 0037, Remove/Install Batteries).
3. Open left-side doors of generator set and locate fuel pressure relief valve (Figure 4).

### WARNING

- Fuel can be returned at highly elevated temperatures and with increased volatility. Wear safety glasses, protective gloves, and protective clothing when performing this test. Avoid contact with returned fuel. Fuel is combustible and toxic to eyes, skin, and respiratory tract. Failure to comply may cause injury or death to personnel.
- Never inject fuel near a fire source. Atomized fuel is highly combustible. Fuel pressure is high enough to penetrate skin. Ensure that spray from the injector nozzle is directed away from all personnel. Direct contact with spray can cause skin cell destruction and blood poisoning. Skin and eye protection are required when working in contact with fuel. Failure to comply may cause injury or death to personnel and damage to equipment.

### CAUTION

Cap/plug all open fuel lines and ports to prevent contamination from entering the fuel system. Failure to comply may cause damage to equipment.

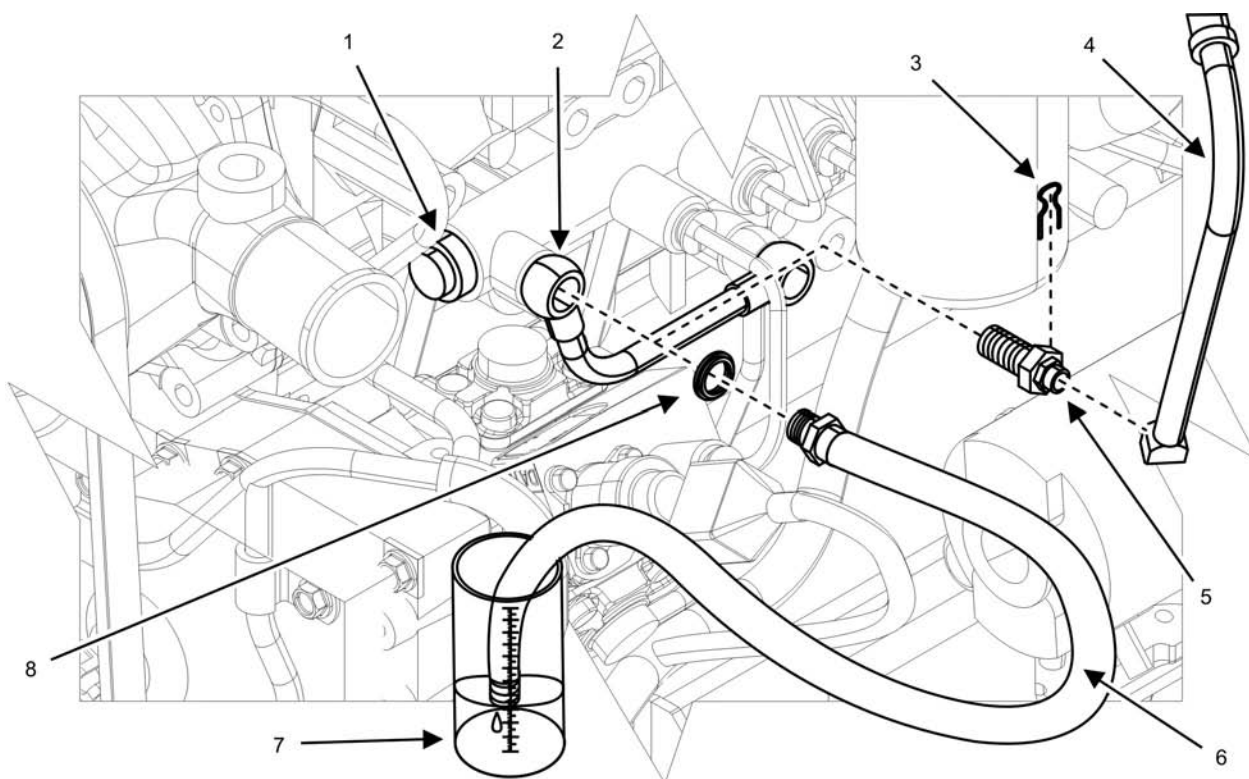
### NOTE

To minimize contamination of fuel system, clean the area around the fuel pressure relief valve with wiping rag prior to performing any repair steps.

4. Check fuel pressure relief valve (Figure 4) for leaks or other damage.



5. Replace as required. See Replace Fuel Pressure Relief Valve task.
6. Place wiping rags under fuel lines to capture spilled fuel when fuel lines are removed.



**Figure 5. Fuel Pressure Relief Valve — Test.**

### NOTE

The purpose of this test is to check for excessive leakage from the fuel pressure relief valve (Figure 5, Item 1) to the upper fuel drain line (Figure 5, Item 2). Sealing washers (Figure 5, Item 8) will be reused on fuel return flow hose (Figure 5, Item 6) during test. Do not remove sealing washers (Figure 5, Item 8), or if removed, save and install while installing fuel return flow hose (Figure 5, Item 6).

The fuel flow from the fuel injector drain line (Figure 5, Item 4) should not be measured or used in determining whether fuel pressure relief valve is operation (Figure 2, Item 1).

7. Remove fuel injector drain line (Figure 5, Item 4) retaining clip (Figure 5, Item 3) from fitting (Figure 5, Item 5).
8. Remove fuel injector drain line (Figure 5, Item 4) and fitting (Figure 5, Item 5) from fuel rail and place end of fuel injector drain line (Figure 5, Item 4) in a suitable container to catch return fuel.
9. Connect the fuel return flow hose (Figure 5, Item 6) with two sealing washers (Figure 5, Item 8) to the upper fuel drain line (Figure 5, Item 2).
10. Place open end of fuel return flow hose (Figure 5, Item 6) in a suitable container (Figure 5, Item 7) to catch drained fuel.
11. Install battery ground cable (WP 0037, Remove/Install Batteries).

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**NOTE**

Test must be run when engine temperature is cold enough that engine will idle for approximately 30 sec. Allow engine to cool if engine does not idle long enough to perform test.

12. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
13. Start engine (TM 9-6115-752-10) and run at idle for 30 sec.
14. Observe fuel flow into container (Figure 5, Item 7).
15. Turn engine control switch to OFF (TM 9-6115-752-10).

**NOTE**

Engine is operated at rated speed as an attempt to reseal fuel pressure relief valve (Figure 2, Item 1) that is found to release fuel during the test.

16. If any fuel is captured during 30 sec test, restart engine and allow engine to reach rated speed (TM 9-6115-752-10).
17. Perform test again (steps 12 through 15) and perform fuel injector test to check for faulty fuel injectors if any fuel is captured during second test (WP 0074, Test/Replace Fuel Injector). Replace fuel rail (Remove Fuel Rail task) if fuel injector test indicates properly functioning fuel injectors.
18. Remove battery ground cable (WP 0037, Remove/Install Batteries).
19. Remove fuel return flow hose (Figure 5, Item 6) from upper fuel drain line (Figure 5, Item 2) with two sealing washers (Figure 2, Item 8). Discard sealing washers (Figure 5, Item 8).
20. Install fuel injector drain line (Figure 5, Item 4) and fitting (Figure 5, Item 5) with two new sealing washers (Figure 5, Item 8) to upper fuel drain line (Figure 5, Item 2).
21. Install retaining clip (Figure 5, Item 3) to fitting (Figure 5, Item 5).
22. Close left-side door.
23. Dispose of captured fuel and soiled wiping rags IAW local SOP.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**TEST/REPLACE FUEL INJECTORS**

---

**INITIAL SETUP**

**Test Equipment**

Beaker, Laboratory (WP 0179, Table 2, Item 3)  
 Nozzle, Fuel Injection, Nonaircraft (WP 0179, Table 2, Item 16)

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/parts**

Assembly, fuel injector (4) (WP 0140, Repair Parts List, Figure 35, Item 1)  
 Lubricating oil, engine (WP 0180, Expendable and Durable Items List, Item 25)  
 Rag, wiping (WP 0180, Item 33)

**Personnel Required**

91D (1)

**References**

WP 0037, Remove/Install Batteries  
 WP 0073, Remove/Install Fuel Rail

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)  
 Engine cool

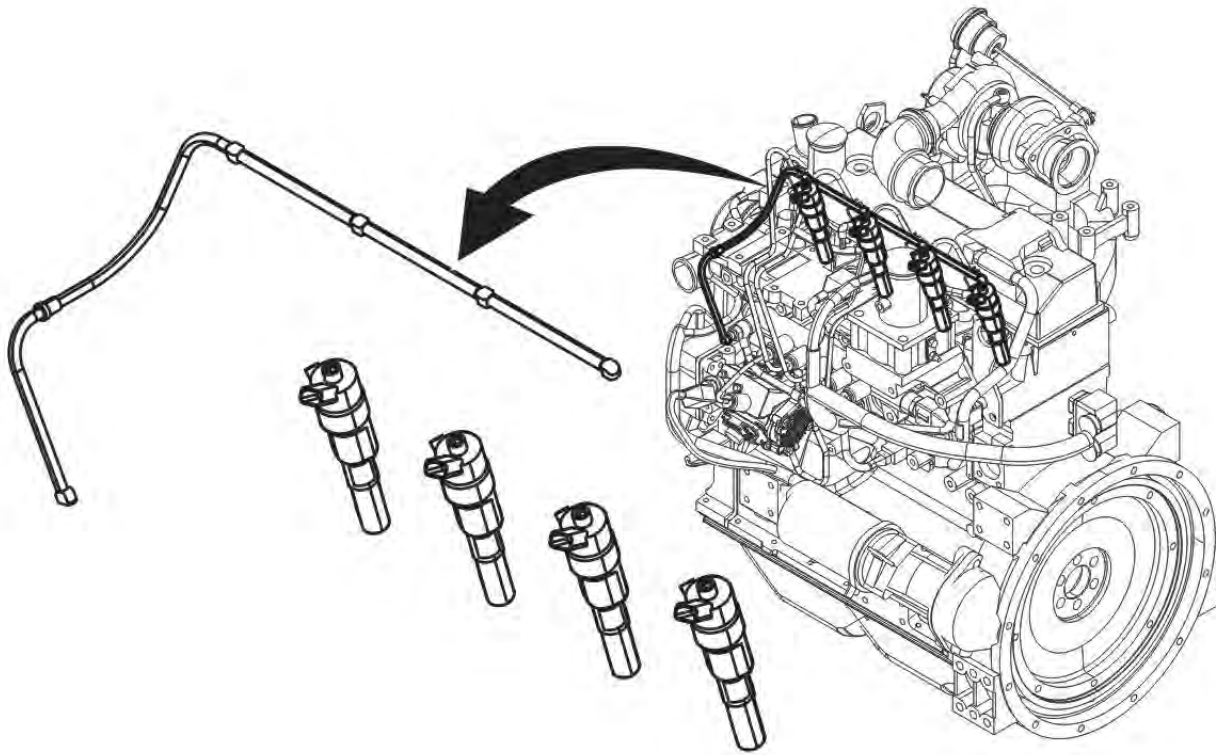
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**TEST/REPLACE FUEL INJECTORS**

**WARNING**

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

## Test Fuel injectors

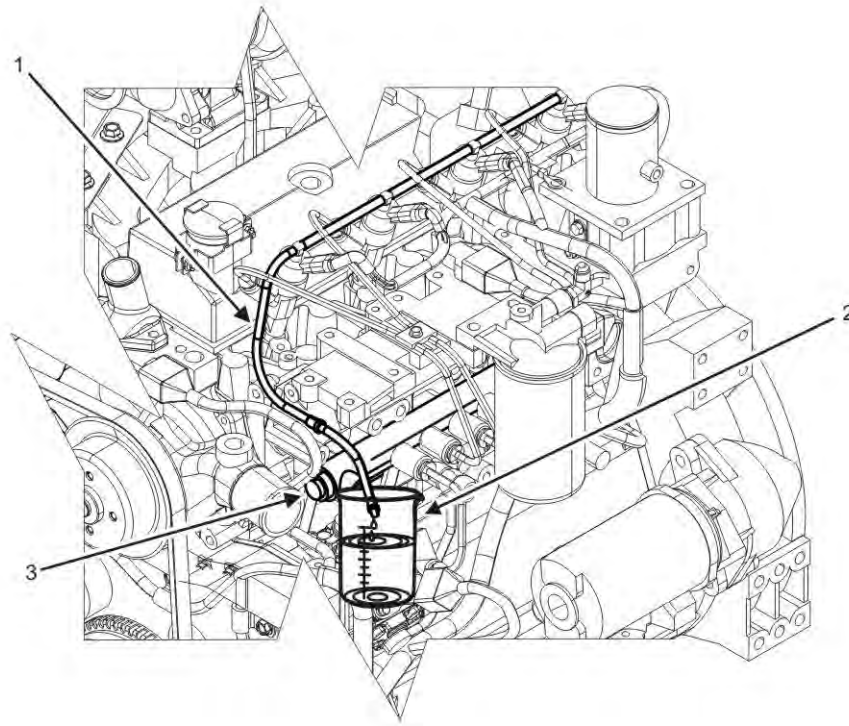


**Figure 1. Fuel Injector and Drain Line — Location.**

### NOTE

The purpose of this test is to check for a failed injector causing excessive fuel flow to the fuel drain line.

1. Locate fuel injectors (Figure 1).
2. Ensure equipment conditions are met in order presented in initial setup.



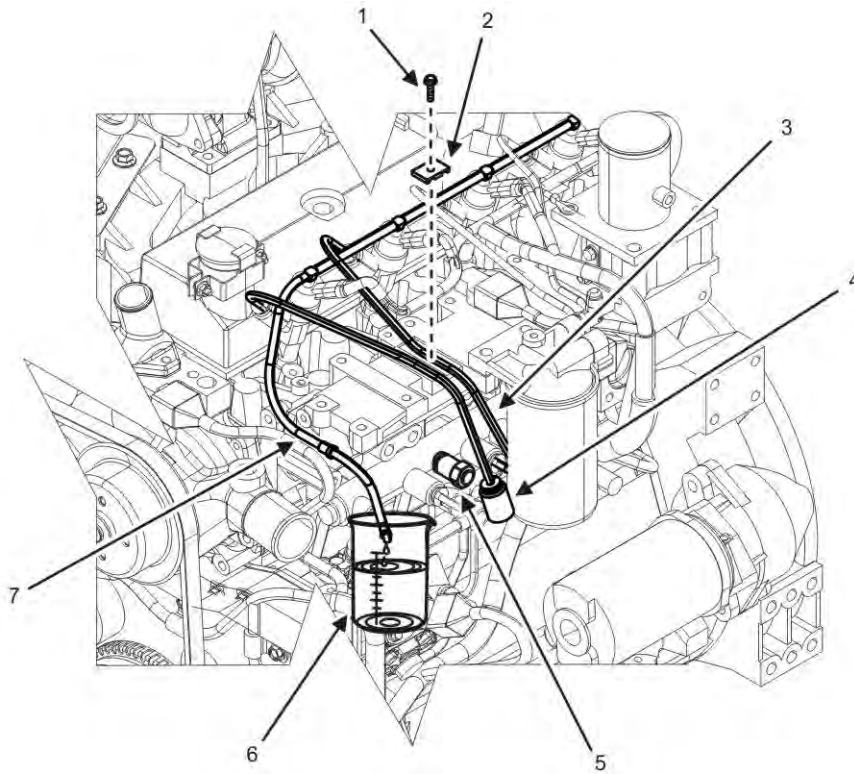
**Figure 2. Fuel Injector Drain Line — Test.**

3. Remove wire clip (not shown) from injector drain line (Figure 2, Item 1) and disconnect injector drain line (Figure 2, Item 1) from fuel rail (Figure 2, Item 3).
4. Place open end of injector drain line (Figure 2, Item 1) into a graduated cylinder (Figure 2, Item 2).
5. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10) and allow engine to idle for 30 seconds while capturing any fuel flow from injector drain line (Figure 2, Item 1) in graduated cylinder (Figure 2, Item 2).
6. Turn engine control switch to OFF (TM 9-6115-752-10) immediately as engine speed changes from idle to operating speed.
7. Note quantity of fuel captured during test. Maximum allowable flow is 0.85 oz/min (25 ml/30 sec).

### **NOTE**

If the injector flow rate observed in step 7 is greater than the specified quantity, there is leakage. In order to determine the cylinder location of the fuel leak, it is necessary to block individual cylinder fuel flow to each injector.

8. Ensure engine control switch is in the OFF position (TM 9-6115-752-10).



**Figure 3. Fuel System Leak Tester.**

9. Remove screw (Figure 3, Item 1) and clamp (Figure 3, Item 2).
10. Disconnect the fuel line (Figure 3, Item 4) connecting high-pressure fuel rail (Figure 3, Item 3) to fuel injector of cylinder number 1.
11. Install fuel system leak tester (Figure 3, Item 5) or equivalent to cylinder number 1 port of high-pressure fuel rail (Figure 3, Item 3).
12. Tighten leak tester (Figure 3, Item 5) to 22 ft/lb (30 Nm).
13. Ensure open end of injector drain line (Figure 3, Item 7) is placed into the graduated cylinder (Figure 3, Item 6).
14. Perform leakage flow test (steps 4 through 6) with cylinder number 1 blocked off, and record the result.
15. Ensure engine control switch is in the OFF position (TM 9-6115-752-10).
16. Remove system leak tester (Figure 3, Item 5) from cylinder number 1 port of high-pressure fuel rail (Figure 3, Item 3).
17. Re-connect the fuel line (Figure 3, Item 4) connecting fuel injector and high-pressure fuel rail (Figure 3, Item 3).
18. Repeat steps 8 through 17 for each fuel injector, blocking off each of the three remaining ports on the high-pressure fuel rail (Figure 3, Item 3) and noting the results of each test.

**NOTE**

The flow rate will decrease below the maximum specified flow when the cylinder with the leaking injector is tested.

Table 1 represents results from a leakage flow test with a leak present in injector number 3.

**Table 1. Example Leakage Flow Test.**

<b>CYLINDER BLOCKED</b>	<b>OZ/30 SEC</b>	<b>ML/30 SEC</b>
1	55	1.85
2	60	2.05
3	17.5	0.6
4	55	1.85

**NOTE**

If the flow is significantly lower in more than one cylinder, more than one injector may be leaking.

Using a lighter grade fuel (lower viscosity level) may cause the flow rate to be significantly lower than specification in all cylinders.

19. Replace fuel injector in cylinder(s) where fuel flow is significantly below specification (see Replace Fuel Injector). Test fuel pressure relief valve for leaks if no leakage difference is found between injectors (WP 0073, Remove/Install Fuel Rail).
20. Install clamp (Figure 3, Item 2) and screw (Figure 3, Item 1).
21. Install the injector drain line (Figure 2, Item 1) to high-pressure fuel pump (Figure 2, Item 3).

**END OF TASK****Replace Fuel Injector****NOTE**

The following procedures are written to remove and replace one fuel injector. If more than one fuel injector must be replaced, repeat the procedure for each fuel injector.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove battery ground cable (WP 0037, Remove/Install Batteries).
3. Open left-side door of generator set and locate fuel injectors and drain line (Figure 1).
4. Remove top body panel (WP 0029, Remove/Install Top Body Panel).
5. Remove air cleaner to turbocharger inlet hose (WP 0019, Remove/Install Air Intake Hose Assemblies).
6. Remove spin-on fuel filter assembly (WP 0072, Remove/Install Spin-On Fuel Filter Assembly).

## CAUTION

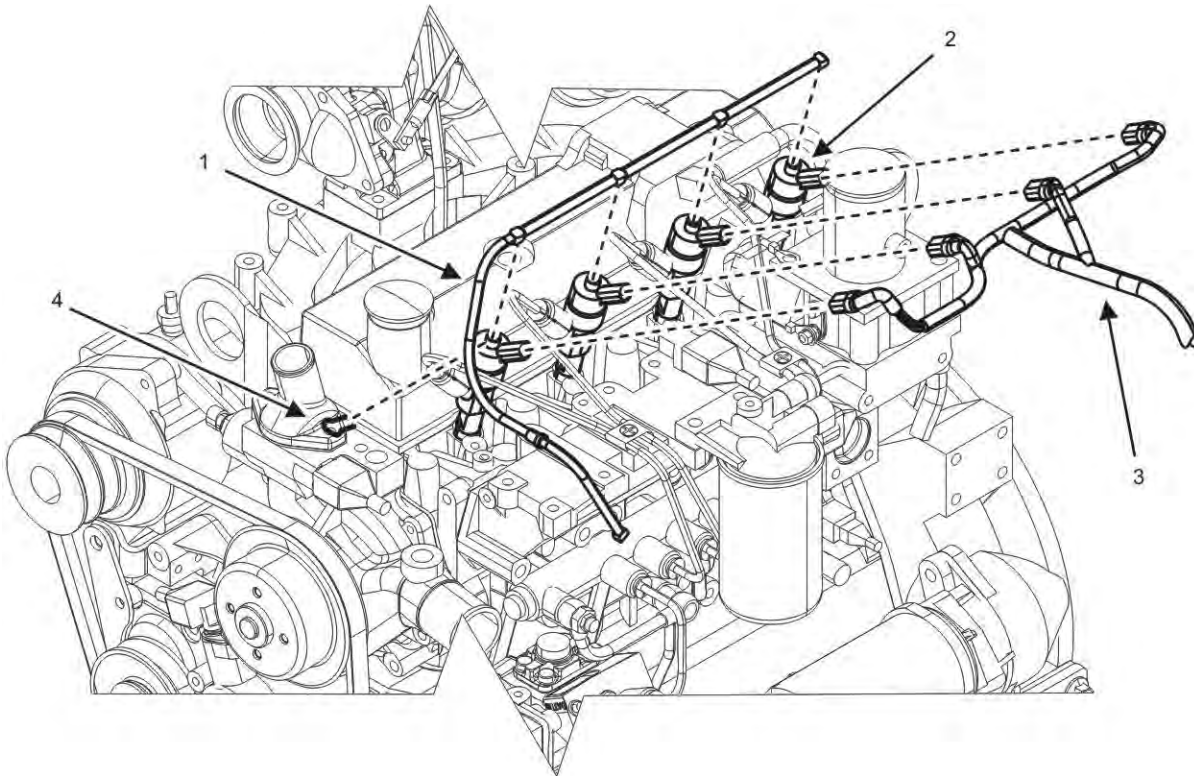
To minimize potential dirt and debris contamination of fuel system, clean the area around the fuel injector prior to performing any repair procedures. Failure to comply may result in damage to equipment.

Dirt and contaminants can damage the fuel system. Cap/plug all open fuel lines and ports to prevent contamination from entering the fuel system. Failure to comply may result in damage to equipment.

## NOTE

There are four fuel injectors on the engine. The high pressure fuel line running to each injector from the fuel rail will differ in shape for each injector. However, the procedure to remove and replace each of the four injectors is the same.

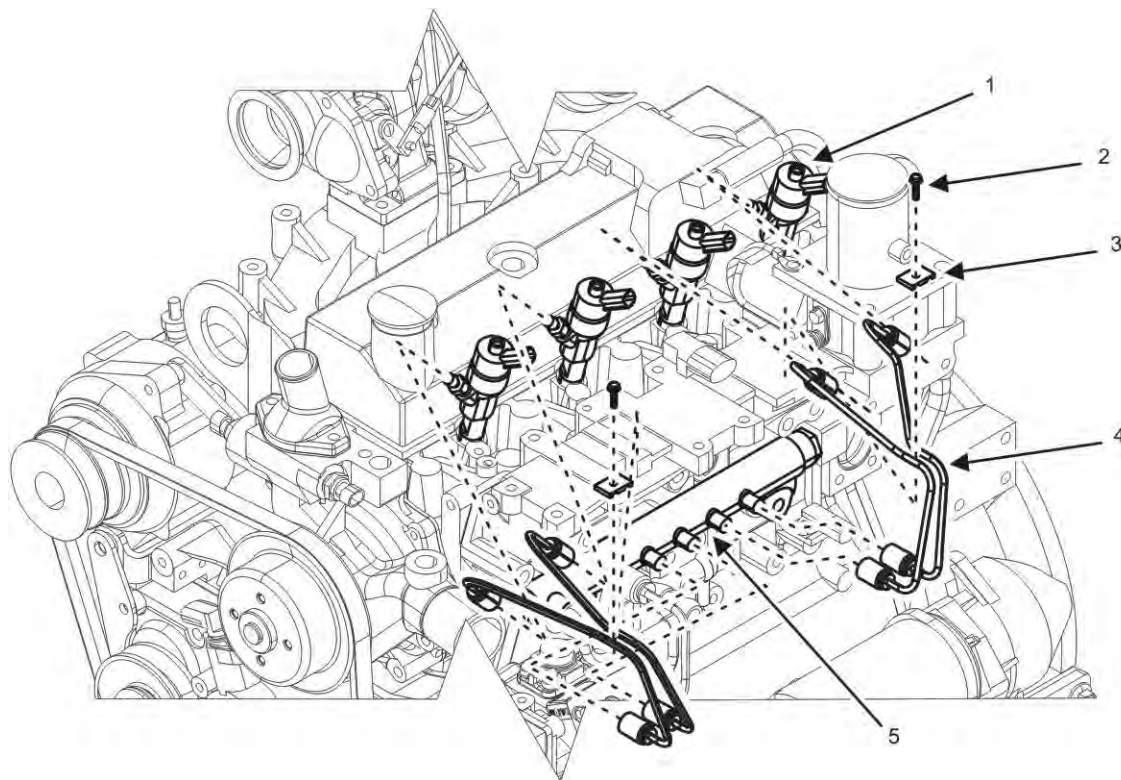
7. Place rags around fuel injector to capture spilled fuel during removal.



**Figure 4. Fuel Injector Drain Line and Electrical Connector — Removal/Installation.**

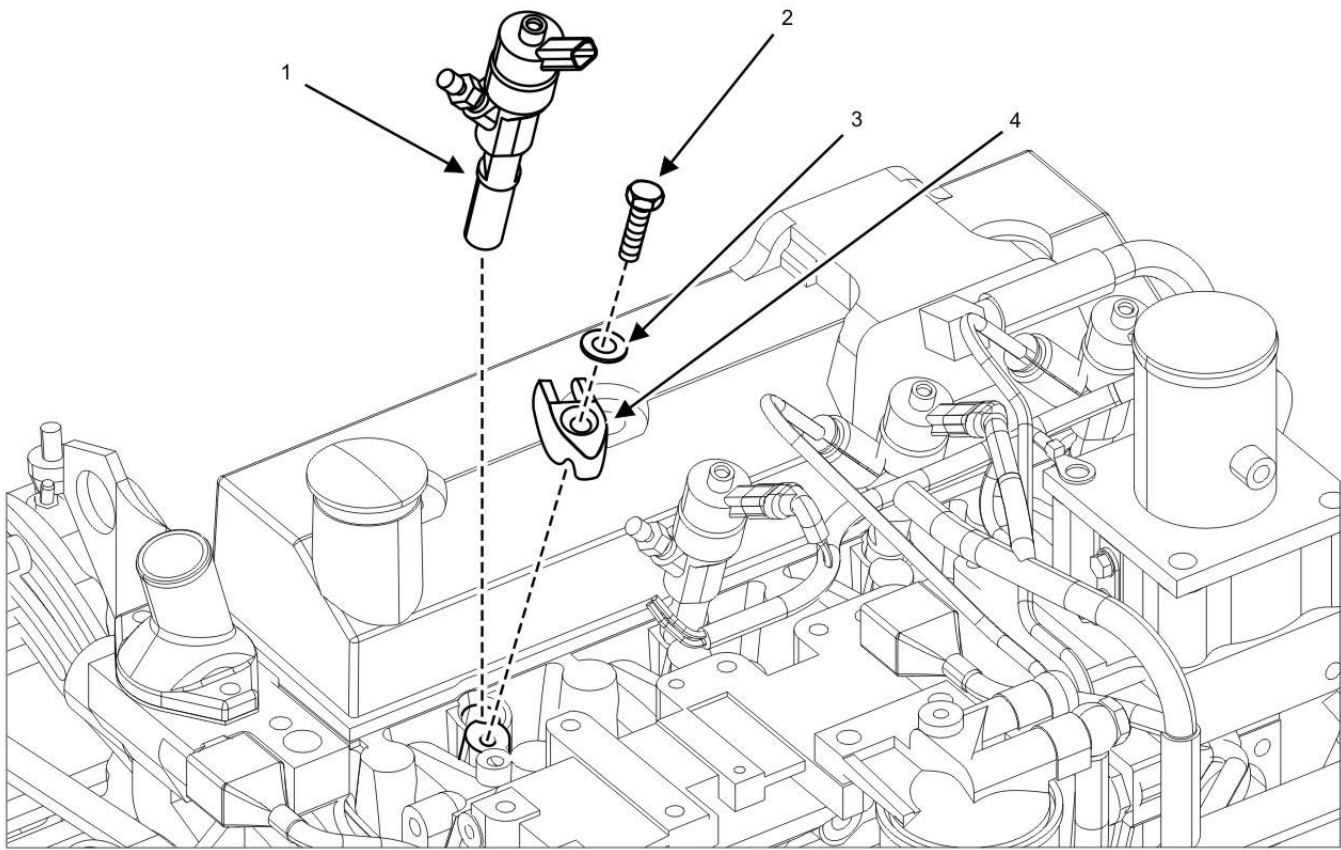
8. Remove wire harness electrical connector (Figure 4, Item 3) from fuel injector (Figure 4, Item 2) connector.
9. Remove retaining clip (Figure 4, Item 4) and separate fuel injector drain line (Figure 4, Item 1) from top of fuel injector (Figure 4, Item 2). Plug fuel injector drain line (Figure 4, Item 1).





**Figure 5. High Pressure Supply Line — Removal/Installation.**

10. Remove screw (Figure 5, Item 2), retaining clip (Figure 5, Item 3) and protective boots (not shown) from both ends of fuel injector high-pressure supply line (Figure 5, Item 4).
11. Remove high-pressure supply line (Figure 5, Item 4) from fuel injector (Figure 5, Item 1) and fuel rail (Figure 5, Item 5) port. Cap exposed ports.



**Figure 6. Fuel Injector — Removal/Installation.**

12. Remove screw (Figure 6, Item 2) and flat washer (Figure 6, Item 3) securing fuel injector clamp (Figure 6, Item 4) to engine.
13. Remove fuel injector clamp (Figure 6, Item 4) from engine.

### **NOTE**

Observe the orientation of the fuel injector slots to ensure new fuel injector is installed in the same manner.

It may be necessary to pry up the fuel injector using a pry bar to facilitate removal.

14. Pull fuel injector (Figure 6, Item 1) up and out of its mounting location on cylinder head.
15. Inspect fuel injector (Figure 6, Item 1) to ensure no part of fuel injector (Figure 6, Item 1) was left inside cylinder head.
16. Remove all dirt and debris from fuel injector mounting area and plug fuel injector port in cylinder head.

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**NOTE**

Inspect new fuel injector (Figure 6, Item 1) to make sure only one sealing washer was installed on the injector nozzle at assembly.

17. Lubricate new fuel injector (Figure 6, Item 1) O-ring (not shown) with clean fuel.
18. Remove cap/plug from fuel injector port in cylinder head.
19. Install fuel injector (Figure 6, Item 1) into fuel injector port in cylinder head. Ensure same orientation noted during removal.
20. Ensure fuel injector (Figure 6, Item 1) is fully seated in fuel injector port.
21. Position fuel injector clamp (Figure 6, Item 4) to its mounting location on cylinder head.
22. Install flat washer (Figure 6, Item 3) and screw (Figure 6, Item 2) and tighten fuel injector clamp (Figure 6, Item 4) to cylinder head.
23. Install two protective boots (not shown) over high-pressure supply line (Figure 5, Item 4) nuts.
24. Secure high-pressure supply line (Figure 5, Item 4) to engine by installing retaining clip (Figure 5, Item 3) and screw (Figure 5, Item 2).
25. Install fuel injector drain line (Figure 4, Item 1) to top of fuel injector (Figure 4, Item 2) and secure using retaining clip (Figure 4, Item 4).
26. Install wire harness electrical connector (Figure 4, Item 3) to fuel injector (Figure 4, Item 2) connector. Ensure wire harness electrical connector (Figure 4, Item 3) is fastened securely.
27. Install spin-on fuel filter assembly (WP 0072, Remove/Install Spin-On Fuel Filter Assembly).
28. Install air cleaner to turbocharger inlet hose (WP 0019, Remove/Install Air Intake Hose Assemblies).
29. Close all generator set doors.
30. Install top body panel (WP 0029, Remove/Install Top Body Panel).
31. Install battery ground cable (WP 0037, Remove/Install Batteries).

**NOTE**

Clean components, wires, connectors, fuel lines, and ports with clean wiping cloth prior to starting operational checkout.

32. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
33. Start engine and check for proper operation and leaks (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply 100% rated load for 30 min (TM 9-6115-752-10).
34. Repair as required.
35. Dispose of captured fluids and soiled rags IAW local SOP.

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL HIGH-PRESSURE FUEL PUMP**

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**INITIAL SETUP:****Test Equipment**

Hose, Fuel Return Flow (WP 0179, Table 2, Item 13)

**Tools and Special Tools**

Puller Attachment, Mechanical (WP 0179, Table 2, Item 19)

Puller Set, Mechanical (WP 0179, Table 2, Item 20)

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Tool, Fuel Pump Retention (WP 0179, Table 2, Item 33)

**Materials/Parts**

Pump, fuel (WP 0142, Repair Parts List, Figure 37, Item 3)

Seal, O-ring (1) (WP 0142, Figure 37, Item 6)

Cap set, protective (WP 0180, Expendable and Durable Items List, Item 8)

Detergent, general purpose (WP 0180, Item 18)

Grease, electrically conductive (WP 0180, Item 22)

Lubricating oil, engine (WP 0180, Item 25)

Rag, wiping (WP 0180, Item 33)

Tag, marker (WP 0180, Item 37)

**Personnel Required**

91D (1)

**References**

WP 0066, Remove/Install 50/60 Hz Engine Assembly

WP 0067, Remove/Install 400 Hz Engine Assembly

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Top body panel removed (WP 0029, Remove/Install Top Body Panel)

Front body panel removed (WP 0030, Remove/Install Front Body Panel)

Electrical connectors disconnected from camshaft position sensor, coolant temperature sensor, engine speed sensor, oil pressure sensor, and high-pressure fuel pump (WP 0087, Remove/Install Engine ECM Wiring Harness)

Four P-clamps removed from around high-pressure fuel pump (WP 0087, Remove/Install Engine ECM Wiring Harness)

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**REMOVE/INSTALL HIGH-PRESSURE FUEL PUMP**
**WARNING**

Fuels used in the generator set are combustible. Do not smoke or use open fire when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.

## Test High-Pressure Fuel Pump

### WARNING

Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.

### NOTE

A measurement of fuel return flow can diagnose a high-pressure fuel pump problem.

1. Remove battery ground cable (WP 0037, Remove/Install Batteries).
2. Open left-side access door and locate high-pressure fuel pump (Figure 1).

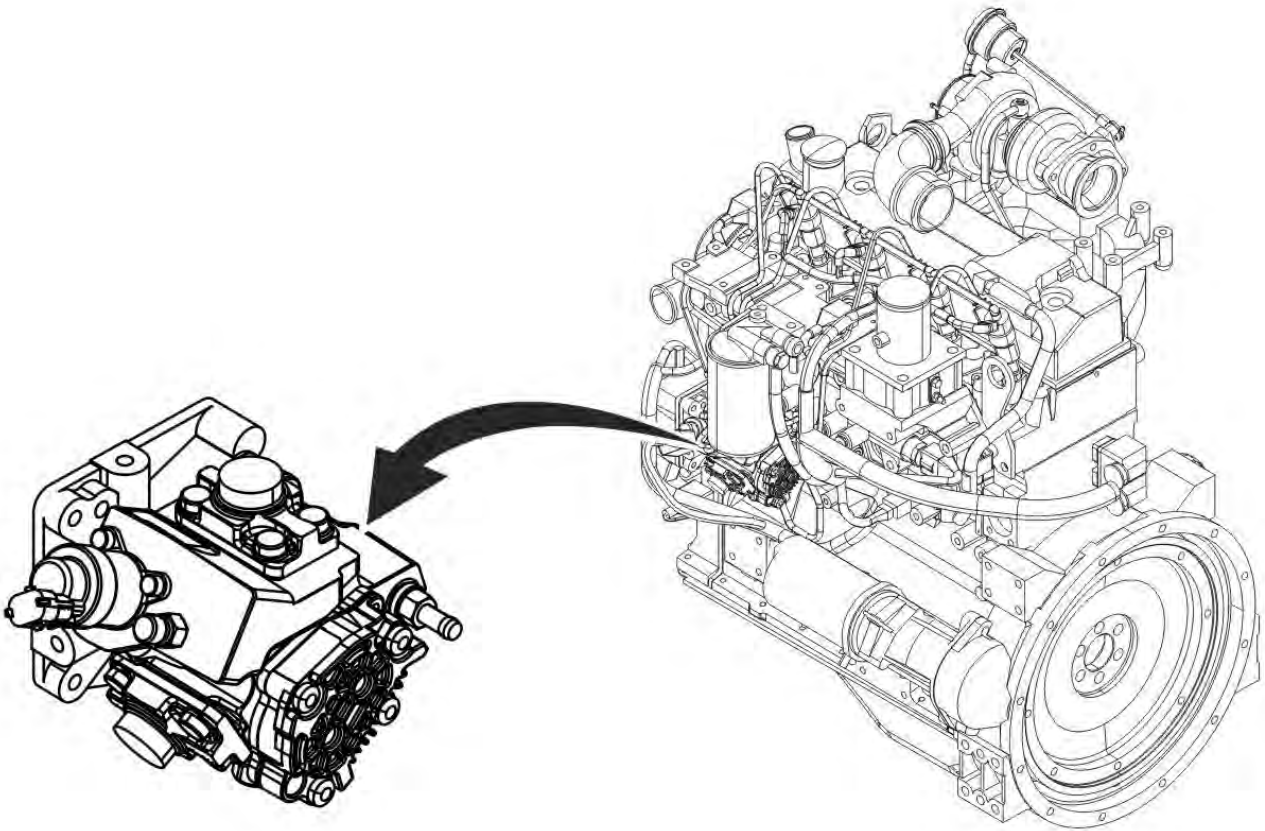
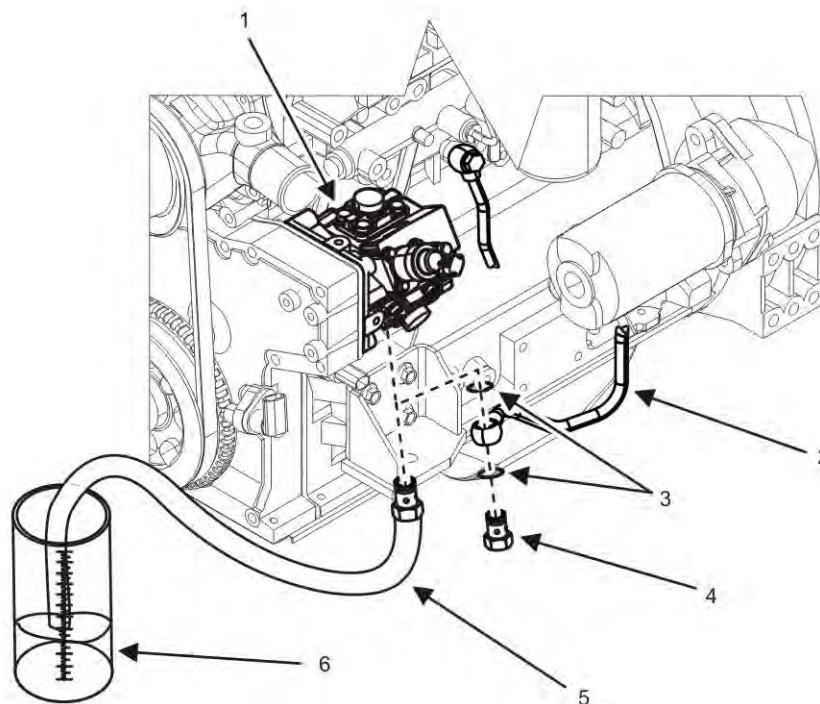


Figure 1. High-Pressure Fuel Pump — Location.



**Figure 2. Test High-Pressure Fuel Pump.**

### NOTE

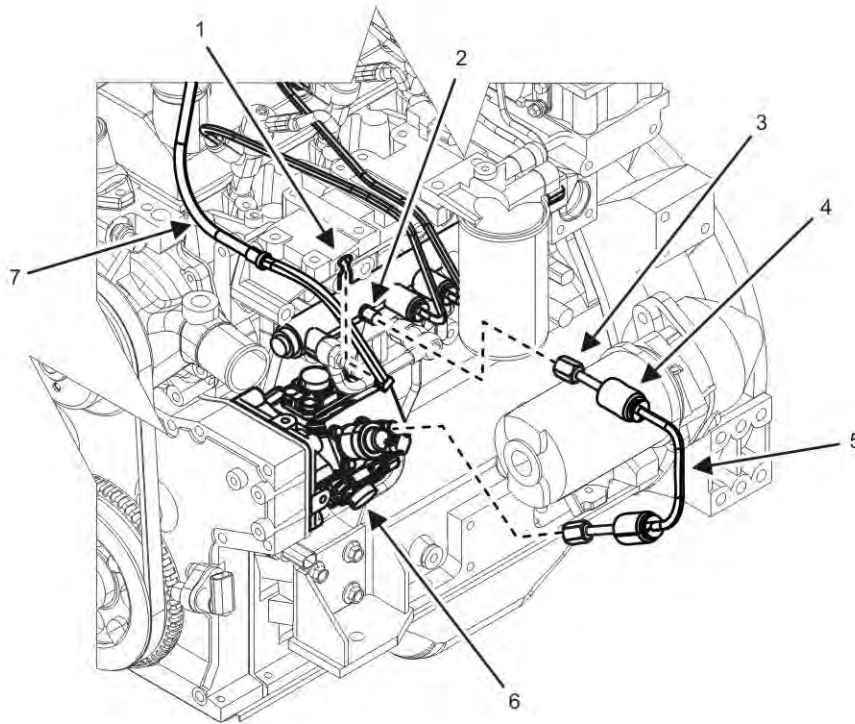
To prevent dirt and debris from entering the fuel system, cap/plug all open fuel lines and fittings.

3. Remove bolt (Figure 2, Item 4) from fuel drain line (Figure 2, Item 2) from high-pressure fuel pump (Figure 2, Item 1).
4. Connect fuel test leak hose (Figure 2, Item 5), reusing sealing washers (Figure 2, Item 3), to fuel drain line (Figure 2, Item 2) and high-pressure fuel pump (Figure 2, Item 1).
5. Place open end fuel test leak hose (Figure 2, Item 5) into 500 mL graduated beaker (Figure 2, Item 6).
6. Install battery ground cable (WP 0037, Remove/Install Batteries).
7. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
8. Start engine (TM 9 6115-752-10) and allow to idle while measuring fuel flow for 30 sec.
9. Replace high-pressure fuel pump (Figure 2, Item 1) if there is less than 9.3 oz (275 mL) collected during a 30 sec test. See Remove High-Pressure Fuel Pump task.
10. Remove battery ground cable (WP 0037, Remove/Install Batteries).
11. Remove fuel test leak hose (Figure 2, Item 5) from high-pressure fuel pump (Figure 2, Item 1).
12. Install bolt (Figure 2, Item 4) and two sealing washers (Figure 2, Item 3) to high-pressure fuel pump (Figure 2, Item 1) and fuel drain line (Figure 2, Item 2).
13. Tighten bolt (Figure 2, Item 4) to 18 ft/lb (25 Nm).
14. Install battery ground cable (WP 0037, Remove/Install Batteries).

### END OF TASK

### Remove High-Pressure Fuel Pump

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door and locate high-pressure fuel pump (Figure 1).



**Figure 3. High-Pressure Fuel Line — Removal.**

### CAUTION

Dirt and debris can contaminate the fuel system. Cap/plug all open fuel lines and ports to prevent contamination from entering the fuel system. Failure to comply may cause damage to equipment.

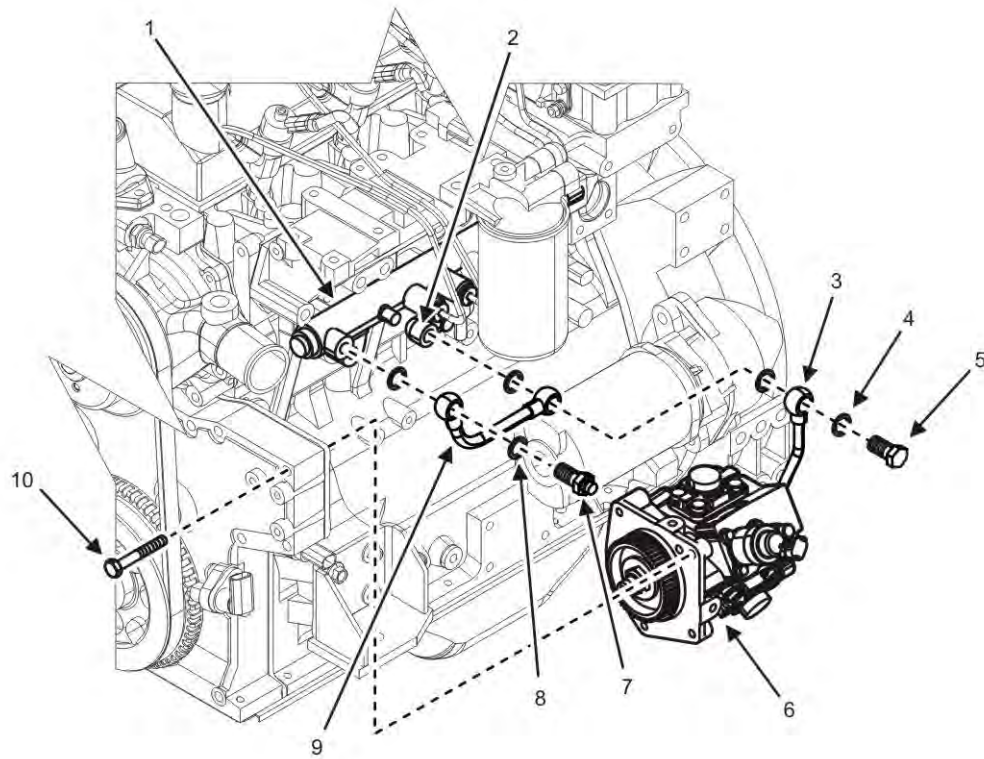
### NOTE

To minimize potential dirt and debris contamination of fuel system, clean the area around the high-pressure fuel pump prior to performing any repair steps.

Tag all electrical wires, connectors, and fuel lines prior to removal to aid at installation.

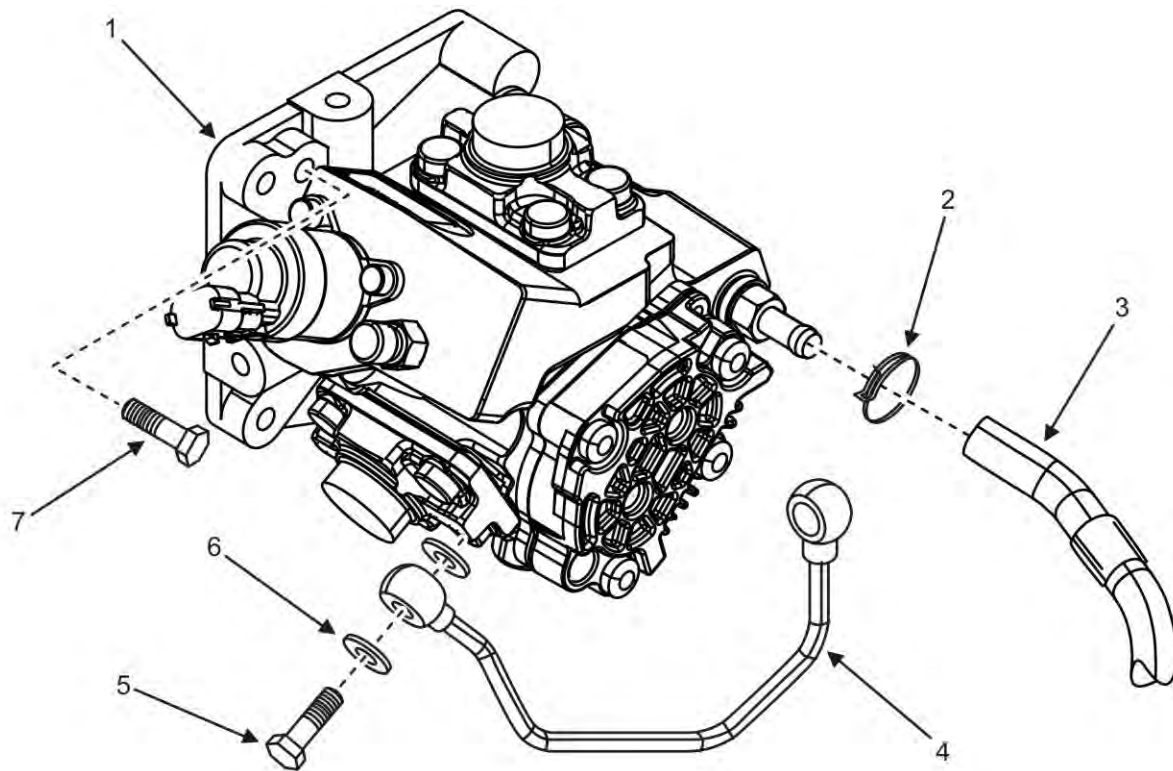
3. Re-position two protective boots (Figure 3, Item 4) to expose nuts (Figure 3, Item 3) on high-pressure supply line (Figure 3, Item 5).
4. Loosen nuts (Figure 3, Item 3) and remove high-pressure supply line (Figure 3, Item 5) from high-pressure fuel pump (Figure 3, Item 6) and fuel rail (Figure 3, Item 2).
5. Release clip (Figure 3, Item 1) and disconnect fuel drain hose (Figure 3, Item 7) from fuel rail (Figure 3, Item 2).





**Figure 4. High-Pressure Fuel Pump — Removal.**

6. Remove fitting (Figure 4, Item 7) and two sealing washers (Figure 4, Item 8) that secure upper drain line (Figure 4, Item 9) to fuel rail (Figure 4, Item 1).
7. Remove upper drain line (Figure 4, Item 9) from fuel rail (Figure 4, Item 1). Discard sealing washers (Figure 4, Item 8).
8. Remove banjo bolt (Figure 4, Item 5) and three sealing washers (Figure 4, Item 4) that secure upper drain line (Figure 4, Item 9) and lower drain line (Figure 4, Item 3) to fuel line adapter port (Figure 4, Item 2).
9. Remove upper and lower drain lines (Figure 4, Items 9 and 3) from fuel line adapter port (Figure 4, Item 2). Discard sealing washers (Figure 4, Item 4).



**Figure 5. Rear of High-Pressure Fuel Pump.**

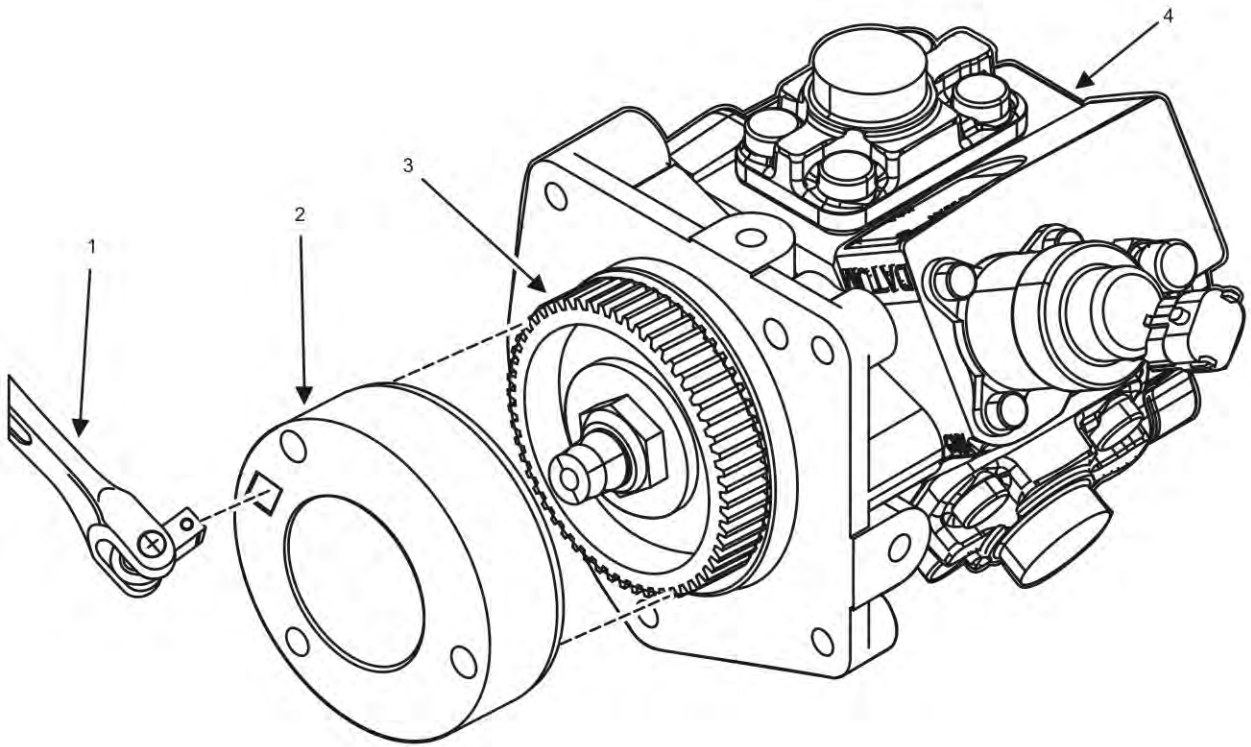
10. Remove banjo bolt (Figure 5, Item 5) and two sealing washers (Figure 5, Item 6) that secure lower drain line (Figure 5, Item 4) to high-pressure fuel pump (Figure 5, Item 1).
11. Remove lower drain line (Figure 5, Item 4) from high-pressure fuel pump (Figure 5, Item 1).
12. Release hose clip (Figure 5, Item 2) that secures low-pressure supply line (Figure 5, Item 3) to rear of high-pressure fuel pump (Figure 5, Item 1).
13. Remove low-pressure supply line (Figure 5, Item 3) from high-pressure fuel pump (Figure 5, Item 1).

### **NOTE**

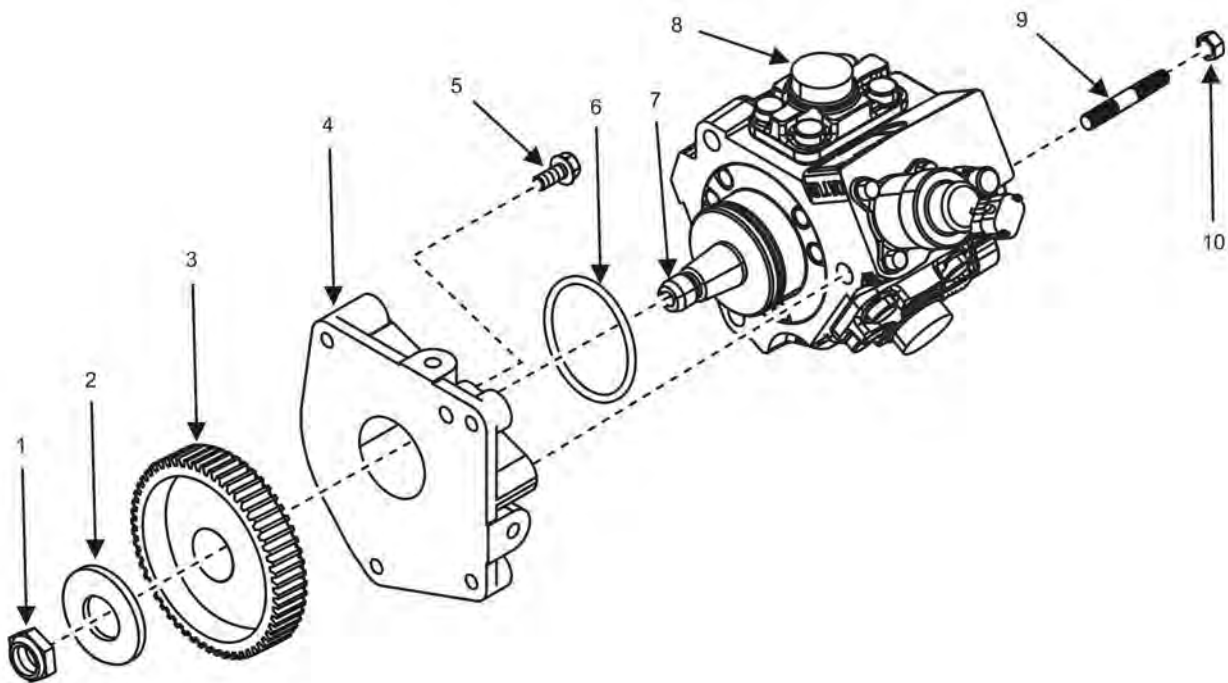
Flange bolt (Figure 5, Item 7) will not come out completely due to limited space

14. Remove four bolts (Figure 4, Item 10) and loosen one flange bolt (Figure 5, Item 7) that secure high-pressure fuel pump (Figure 4, Item 6) to engine front cover.
15. Remove high-pressure fuel pump (Figure 4, Item 6) from generator set and place on a suitable work surface.

**END OF TASK**

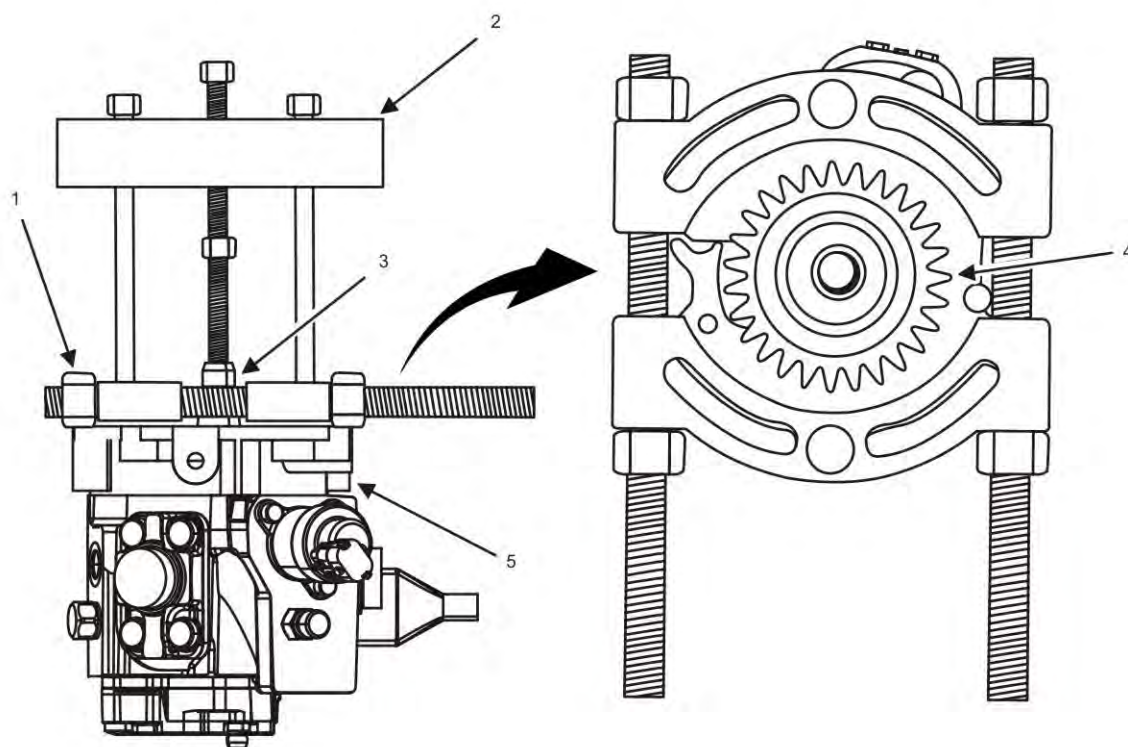
**Remove High-Pressure Fuel Pump Drive Gear****Figure 6. Fuel Pump Retention Tool.**

1. Install high-pressure fuel pump retention tool (Figure 6, Item 2) to drive gear (Figure 6, Item 3) of high-pressure fuel pump (Figure 6, Item 4).
2. Use high-pressure fuel pump retention tool (Figure 6, Item 2) and a 1/2-in drive breaker bar (Figure 6, Item 1) to hold drive gear (Figure 6, Item 3) steady.



**Figure 7. High-Pressure Fuel Pump Flange — Removal.**

3. Remove nut (Figure 7, Item 1) and flat washer (Figure 7, Item 2) securing drive gear (Figure 7, Item 3) to front of high-pressure fuel pump (Figure 7, Item 8).



**Figure 8. High-Pressure Fuel Pump Drive Gear — Removal.**

4. Install a bearing separator (Figure 8, Item 1) between high-pressure fuel pump mounting flange (Figure 8, Item 5) and drive gear (Figure 8, Item 4).
5. Install a puller (Figure 8, Item 2) onto bearing separator (Figure 8, Item 1) and high-pressure fuel pump shaft (Figure 8, Item 3).
6. Rotate puller (Figure 8, Item 2) screw until drive gear (Figure 8, Item 4) has separated from high-pressure fuel pump shaft (Figure 8, Item 3).
7. Remove puller (Figure 8, Item 2) from bearing separator (Figure 8, Item 1).
8. Remove drive gear (Figure 8, Item 4) from high-pressure fuel pump shaft (Figure 8, Item 3).
9. Remove bearing separator (Figure 8, Item 1) from high-pressure fuel pump (Figure 7, Item 8).
10. Remove three nuts (Figure 7, Item 10) and three studs (Figure 7, Item 9) securing high-pressure fuel pump (Figure 7, Item 8) to mounting flange (Figure 7, Item 4).
11. Remove high-pressure fuel pump (Figure 7, Item 8) from mounting flange (Figure 7, Item 4).
12. Remove and discard O-ring (Figure 7, Item 6) from high-pressure fuel pump (Figure 7, Item 8).

## **END OF TASK**

### **Inspect High-Pressure Fuel Pump**

1. Inspect high-pressure fuel pump (Figure 7, Item 8) for obvious damage.
2. Replace high-pressure fuel pump (Figure 7, Item 8) if damaged.
3. Inspect drive gear (Figure 7, Item 3) for cracked teeth or other obvious damage.

4. Replace drive gear (Figure 7, Item 3) if teeth are cracked or damaged.
5. Inspect mounting flange (Figure 7, Item 4) and bolt (Figure 7, Item 5) for cracks and other obvious damage.
6. Replace mounting flange (Figure 7, Item 4) or bolt (Figure 7, Item 5) if cracked or damaged.
7. Inspect high-pressure supply line (Figure 3, Item 5) for signs of obvious damage, and replace as required.
8. Inspect fuel drain hose (Figure 3, Item 7) for signs of obvious damage. Replace as required.
9. Inspect low-pressure supply line (Figure 5, Item 3) for signs of obvious damage. Replace as required.
10. Inspect upper drain line (Figure 4, Item 9) and lower drain line (Figure 4, Items 3) for signs of obvious damage. Replace components as required.

## END OF TASK

### Install High-Pressure Fuel Pump Mounting Flange and Drive Gear

1. Apply a thin coat of engine oil to new O-ring (Figure 7, Item 6) prior to installation.
2. Install new O-ring (Figure 7, Item 6) onto mounting flange (Figure 7, Item 4) of high-pressure fuel pump (Figure 7, Item 8).
3. Install and tighten three studs (Figure 7, Item 9) into mounting flange (Figure 7, Item 4).
4. Install high-pressure fuel pump (Figure 7, Item 8) onto mounting flange (Figure 7, Item 4).
5. Install three nuts (Figure 7, Item 10) to mounting flange studs (Figure 7, Item 9) and secure high-pressure fuel pump (Figure 7, Item 8) to mounting flange (Figure 7, Item 4).
6. Position drive gear (Figure 7, Item 3) onto shaft (Figure 7, Item 7) of high-pressure fuel pump (Figure 7, Item 8).
7. Press drive gear (Figure 7, Item 3) onto shaft (Figure 7, Item 7) of high-pressure fuel pump (Figure 7, Item 8) using a hydraulic press.
8. Install high-pressure fuel pump retention tool (Figure 6, Item 2) to drive gear (Figure 6, Item 3).
9. Use high-pressure fuel pump retention tool (Figure 6, Item 2) and a 1/2-in drive breaker bar (Figure 6, Item 1) to hold drive gear (Figure 6, Item 3) steady.
10. Install nut (Figure 7, Item 1) and flat washer (Figure 7, Item 2) securing drive gear (Figure 7, Item 3) to high-pressure fuel pump (Figure 7, Item 8).
11. Tighten nut (Figure 7, Item 1) to 52 ft/lb (70 Nm).

## END OF TASK

### Install High-Pressure Fuel Pump

## CAUTION

High-pressure fuel pump driveshaft and drive gear must be clean and dry before assembly.  
Failure to comply may cause damage to equipment.

1. Position high-pressure fuel pump (Figure 4, Item 6) to its mounting location on engine and align mounting holes.
2. Install and tighten four mounting bolts (Figure 4, Item 10) and one flange bolt (Figure 5, Item 7) to secure high-pressure fuel pump (Figure 4, Item 6) to engine.
3. Tighten mounting bolts (Figure 4, Item 10) to 22 ft/lb (30 Nm).
4. Install low-pressure supply line (Figure 5, Item 3) to high-pressure fuel pump (Figure 5, Item 1).

5. Secure low-pressure supply line (Figure 5, Item 3) to high-pressure fuel pump (Figure 5, Item 1) by installing hose clip (Figure 5, Item 2).
6. Position lower drain line (Figure 5, Item 4) on high-pressure fuel pump (Figure 5, Item 1) and secure by installing two new sealing washers (Figure 5, Item 6) and banjo bolt (Figure 5, Item 5). Finger-tighten and ensure proper orientation.
7. Position upper drain line (Figure 4, Item 9) and lower drain line (Figure 4, Item 3) to fuel line adapter port (Figure 4, Item 2) and align mounting holes.
8. Install banjo bolt (Figure 4, Item 5) and three new sealing washers (Figure 4, Item 4), and secure lower drain line (Figure 4, Item 3) and upper drain line (Figure 4, Item 9) to fuel line adapter port (Figure 4, Item 2) finger-tight.
9. Position upper drain line (Figure 4, Item 9) to fuel rail (Figure 4, Item 1) and secure by installing two new sealing washers (Figure 4, Item 8) and fitting (Figure 4, Item 7).
10. Tighten banjo bolt (Figure 5, Item 5), fitting (Figure 4, Item 7), and banjo bolt (Figure 4, Item 5) to secure upper and lower drain lines (Figure 4, Items 9 and 3).
11. Tighten banjo bolts (Figure 4, Item 5) to 18 ft/lb (25 Nm).
12. Install fuel drain hose (Figure 3, Item 7) to fuel rail (Figure 3, Item 2).
13. Install clip (Figure 3, Item 1) to fuel drain line (Figure 3, Item 7).
14. Position high-pressure supply line (Figure 3, Item 5) to fuel rail (Figure 3, Item 2) and high-pressure fuel pump (Figure 3, Item 6) ports and secure the mounting nuts (Figure 3, Item 3).
15. Tighten mounting nuts (Figure 3, Item 3) to 15 ft/lb (20 Nm).
16. Position protective boots (Figure 3, Item 4) over two high-pressure supply lines nuts (Figure 3, Item 3).
17. Connect ECM wiring harness connectors to the following electrical components (WP 0087, Remove/Install Engine ECM Wiring Harness):
  - a. Camshaft position sensor.
  - b. Coolant temperature sensor.
  - c. Engine speed sensor.
  - d. Oil pressure sensor.
  - e. High-pressure fuel pump.
18. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).

### NOTE

Clean components, wires, connectors, fuel lines, and ports with clean wiping cloth prior to starting operational checkout.

19. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
20. Start engine and check for proper operation and leaks (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
21. Repair as required.
22. Dispose of captured fluids and soiled rags IAW local SOP.

**END OF TASK**

**END OF WORK PACKAGE**





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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL WATER PUMP**

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**INITIAL SETUP:****Test Equipment**

Thermometer, Self-Indicating (WP 0179, Table 2, Item 29)

**Tools and Special Tools**

Hammer, Hand, Soft Face, Dead Blow (WP 0179, Table 2, Item 12)

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Assembly, water pump (1) (WP 0146, Repair Parts List, Figure 41, Item 1)

Antifreeze, ethylene glycol (WP 0180, Expendable and Durable Items List, Item 2)

Cap set, protective (WP 0180, Item 8)

Compound, antiseize (WP 0180, Item 14)

Grease, electrically conductive (WP 0180, Item 22)

Pan, drain (WP 0180, Item 30)

Rag, wiping (WP 0180, Item 33)

Sealant (WP 0180, Item 34)

**Personnel Required**

91D (1)

Assistant (1)

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**References**

WP 0039, Remove/Install Engine Wiring Harness

WP 0088, Remove/Install Engine ECM Sensors

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

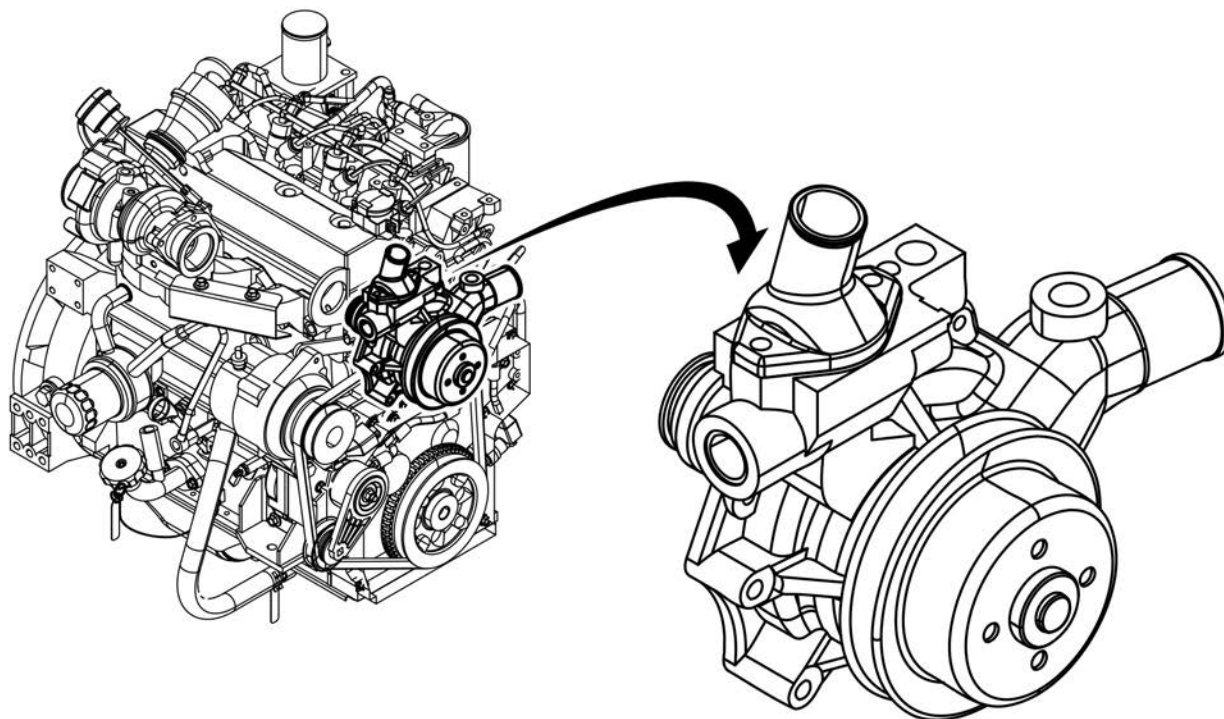
Cooling system drained (WP 0022, Service Cooling System)

Front body panel removed (WP 0030, Remove/Install Front Body Panel)

Battery-charging alternator belt removed (WP 0080, Remove/Install Battery-Charging Alternator Belt)

Radiator hoses removed (WP 0025, Remove/Install Radiator Hose and Tube Assemblies)

Thermostat removed (WP 0077, Remove/Install Thermostat)

**REMOVE/INSTALL WATER PUMP****Remove Water Pump**

**Figure 1. Water Pump — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate water pump on front of engine (Figure 1).
3. Disconnect camshaft position sensor (WP 0088, Remove/Install Engine ECM Sensors).

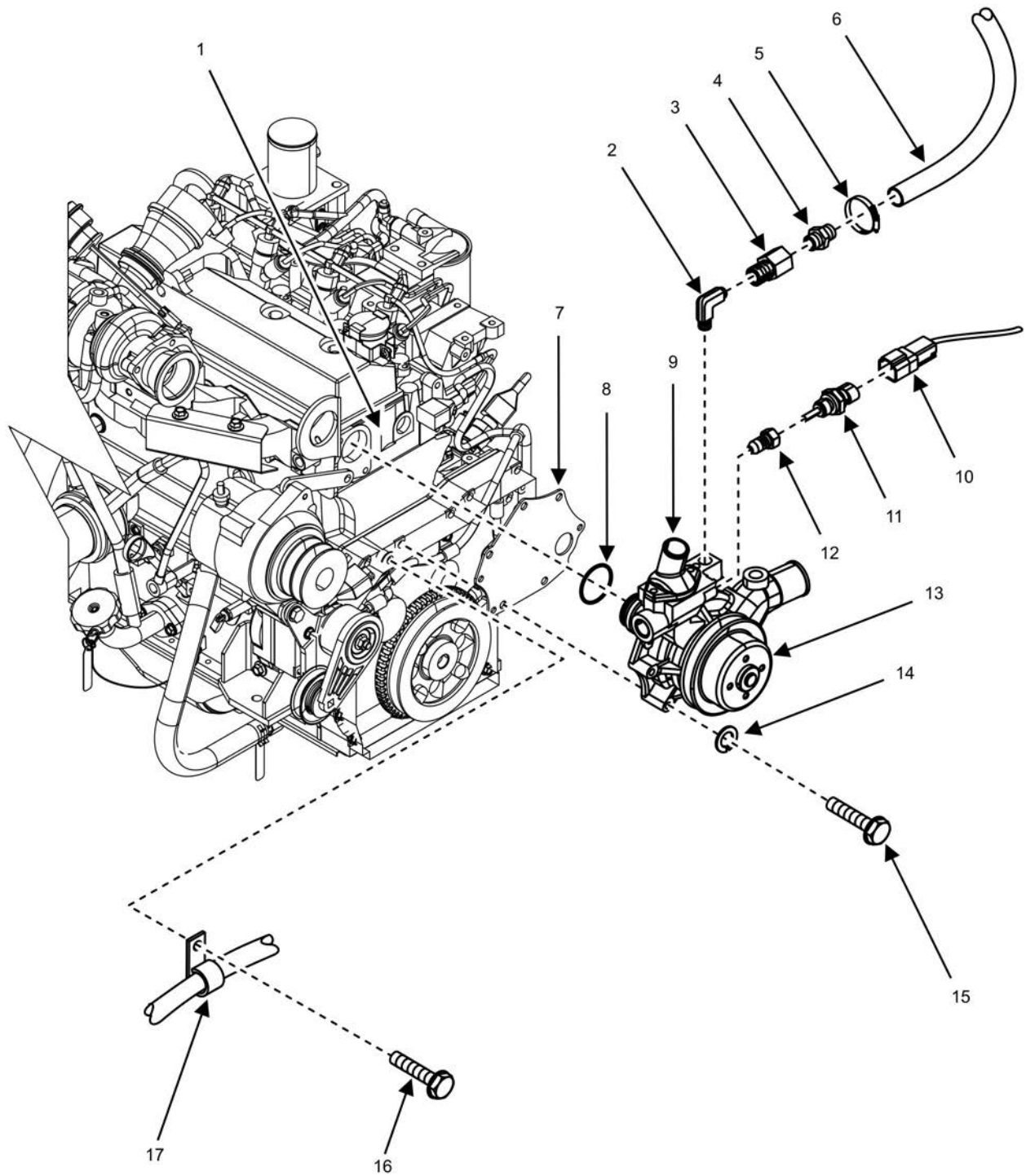


Figure 2. Water Pump — Removal/Installation.

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**NOTE**

Tag or mark all electrical wires and connectors during removal to aid at installation.

4. Tag and disconnect electrical connector (Figure 2, Item 10) from coolant temperature sensor (Figure 2, Item 11) on right-side of water pump (Figure 2, Item 13).
5. Remove coolant temperature sensor (Figure 2, Item 11) from threaded adapter (Figure 2, Item 12).
6. Remove threaded adapter (Figure 2, Item 12) from water pump (Figure 2, Item 13). Plug coolant temperature sensor port.
7. Loosen hose clamp (Figure 2, Item 5) on winterization kit supply hose (Figure 2, Item 6) and slide away from nipple adapter (Figure 2, Item 4).
8. Remove winterization kit supply hose (Figure 2, Item 6) from nipple adapter (Figure 2, Item 4) and drain winterization kit supply hose (Figure 2, Item 6), if necessary. Plug end of winterization kit hose (Figure 2, Item 6).
9. Remove nipple adapter (Figure 2, Item 4) from threaded adapter (Figure 2, Item 3).
10. Remove threaded adapter (Figure 2, Item 3) from elbow fitting (Figure 2, Item 2).
11. Remove elbow fitting (Figure 2, Item 2) from thermostat housing (Figure 2, Item 9). Plug winterization hose port in thermostat housing (Figure 2, Item 9).
12. Remove water pump mounting bolt (Figure 2, Item 16) on lower left-side of water pump (Figure 2, Item 13) and move cable (Figure 2, Item 17) clear of water pump mounting bolt (Figure 2, Item 16).
13. Place wiping rags under water pump (Figure 2, Item 13) to catch spilled coolant.
14. Remove four cap screws (Figure 2, Item 15) and four lock washers (Figure 2, Item 14) securing water pump (Figure 2, Item 13) to engine (Figure 2, Item 1).

**NOTE**

It may be necessary to tap water pump (Figure 2, Item 13) with rubber hammer in order to separate from engine (Figure 2, Item 1).

15. Remove water pump (Figure 2, Item 13) and gasket (Figure 2, Item 7) from engine (Figure 2, Item 1) and place on suitable work surface. Discard gasket (Figure 2, Item 7).
16. Remove and discard O-ring (Figure 2, Item 8) from water pump (Figure 2, Item 13).
17. Cover water pump opening in engine (Figure 2, Item 1) to prevent dirt and debris from entering engine (Figure 2, Item 1).

**END OF TASK**

## Test Temperature Sensor

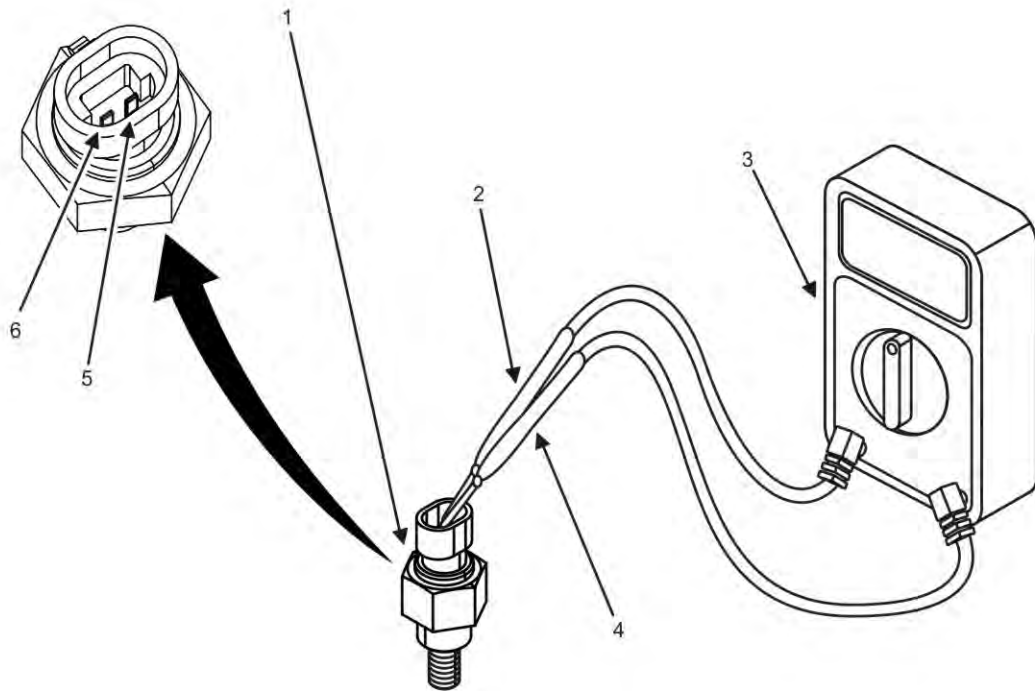


Figure 3. Test Temperature Sensor.

### WARNING

Cooling system operates at high temperature and pressure. Contact with high-pressure steam and/or liquids can cause burns and scalding. Shut down generator set and allow system to cool before performing checks, services, and maintenance. Wear gloves, additional protective clothing, and goggles as required.

### NOTE

There is one temperature sensor connected to ECM wiring (WP 0088, Remove/Install Engine ECM Sensors). Temperature sensor can be tested while installed or tested once removed. Ambient air temperature will need to be determined when temperature sensor is removed. When testing while installed, DCS coolant temperature reading will need to be recorded before removing unit wiring connector from temperature sensor. Use appropriate temperature range in Table 1 when comparing Ohm measurement obtained from test.

Table 1. ECM Temperature Sensor Resistance.

DEGREES (°F (°C))	RESISTANCE (OHMS)
32 (0)	30,000 to 37,000
77 (25)	9300 to 10,700
122 (50)	3200 to 3800
176 (80)	1000 to 1300
203 (95)	700 to 800

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**NOTE**

ECM temperature sensor is accessible through left-side door.

1. Position temperature sensor (Figure 3, Item 1) on a suitable work surface if removed from engine or open left-side door and leave installed in engine.
2. Allow 5 min for temperature sensor (Figure 3, Item 1) to reach ambient air temperature if testing temperature sensor (Figure 3, Item 1) removed from engine.
3. Determine ambient air temperature using a thermometer if testing temperature sensor (Figure 3, Item 1) removed from engine.
4. Determine coolant temperature on DCS screen by installing negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries) and turning engine control switch to PRIME & RUN if testing temperature sensor (Figure 3, Item 1) installed in engine (TM 9-6115-752-10).
5. Record reading, remove negative ground cable from right-hand battery (WP 0037, Remove/Install Batteries), and turn engine control switch to OFF (TM 9-6115-752-10).

**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

6. Disconnect unit wiring (not pictured) from temperature sensor (Figure 3, Item 1), if necessary.
7. Attach one multimeter lead (Figure 3, Item 2) set to Ohms to one connector lead (Figure 3, Item 5) of temperature sensor (Figure 3, Item 1).
8. Attach second multimeter lead (Figure 3, Item 4) to second connector lead (Figure 3, Item 6) of temperature sensor.
9. Record multimeter (Figure 3, Item 3) measurement.
10. Compare multimeter (Figure 3, Item 3) measurement with corresponding temperature in Table 1.
11. Replace temperature sensor (Figure 3, Item 1) if multimeter (Figure 3, Item 3) measurement does not correspond to Table 1 Ohm values.
12. Remove multimeter leads (Figure 3, Items 2 and 4) and connect unit wiring (not pictured) to temperature sensor (Figure 3, Item 1) and close left-side door, if necessary.

**END OF TASK****Inspect Water Pump**

1. Inspect water pump (Figure 2, Item 13) for damage and corrosion.
2. Replace water pump (Figure 2, Item 13) if damaged or corroded.
3. Inspect coolant temperature sensor (Figure 2, Item 11) for signs of obvious damage.
4. Replace damaged coolant temperature sensor (Figure 2, Items 11).

**END OF TASK**

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**Install Water Pump****CAUTION**

Do not let dirt or debris fall into the cooling system. Failure to comply may cause damage to equipment.

**NOTE**

Wipe down hoses, parts, and connectors with wiping rag after installation to aid during leak checks.

1. Remove cover from water pump opening in engine (Figure 2, Item 1).
2. Clean mating surface of water pump (Figure 2, Item 13) and engine (Figure 2, Item 1) with wiping rags.
3. Apply coat of anti-seize lubricant to threads of four cap screws (Figure 2, Item 15).
4. Lubricate new O-ring (Figure 2, Item 8) with clean coolant and install onto water pump (Figure 2, Item 13).
5. Position new gasket (Figure 2, Item 7) and water pump (Figure 2, Item 13) on engine (Figure 2, Item 1) and align mounting holes.
6. Install and tighten four screws (Figure 2, Item 15) and four new lock washers (Figure 2, Item 14) through water pump (Figure 2, Item 13) and into engine (Figure 2, Item 1).
7. Position cable (Figure 2, Item 17) to its mounting location on lower exhaust side of water pump and secure by installing mounting bolt (Figure 2, Item 16).
8. Remove plug (not shown) from winterization hose port on top of thermostat housing (Figure 2, Item 9).

**NOTE**

To prevent leaks, apply pipe joint compound on all pipe thread fittings and adapters prior to installation.

9. Apply pipe thread sealant to elbow fitting (Figure 2, Item 2).
10. Install and tighten elbow fitting (Figure 2, Item 2) into coolant temperature sensor port on thermostat housing (Figure 2, Item 9). Ensure orientation of elbow fitting (Figure 2, Item 2) allows installation of adapters and hose.

**NOTE**

To prevent leaks, apply pipe thread sealant on all pipe thread fittings and adapters prior to installation.

11. Apply pipe thread sealant to threaded adapter (Figure 2, Item 3).
12. Install and tighten threaded adapter (Figure 2, Item 3) into elbow fitting (Figure 2, Item 2).

**NOTE**

To prevent leaks, apply pipe thread sealant on all pipe thread fittings and adapters prior to installation.

13. Apply pipe thread sealant to nipple adapter (Figure 2, Item 4).
14. Install and tighten nipple adapter (Figure 2, Item 4) into threaded adapter (Figure 2, Item 3).

15. Loosen hose clamp (Figure 2, Item 5), slide winterization kit supply hose (Figure 2, Item 6) over nipple adapter (Figure 2, Item 4), and tighten hose clamp (Figure 2, Item 5) onto nipple adapter (Figure 2, Item 4). Ensure hose clamp (Figure 2, Item 5) is approximately centered over nipple adapter (Figure 2, Item 4).

### NOTE

Wipe down hoses, parts, and connectors with wiping rag after installation to aid during leak checks.

To prevent leaks, apply pipe thread sealant on all pipe thread fittings and adapters prior to installation.

16. Remove plug (not shown) from port on right-side of water pump (Figure 2, Item 13).
17. Install and hand-tighten threaded adapter (Figure 2, Item 12) into port on right-side of water pump (Figure 2, Item 13).
18. Install and hand-tighten coolant temperature sensor (Figure 2, Item 11) into threaded adapter (Figure 2, Item 12).

### NOTE

Use tags or markings applied to electrical wires and connector at time of removal as aids during installation. Remove and discard all tags only after operational checkout is complete.

19. Install electrical connector (Figure 2, Item 10) into coolant temperature sensor (Figure 2, Item 11) and ensure connector clip is secured. Replace protective boot (not shown) over coolant temperature sensor (Figure 2, Item 11).

### NOTE

Wipe down hoses, parts, and connectors with wiping rag after installation to aid during leak checks.

20. Install thermostat (WP 0077, Remove/Install Thermostat).
21. Install radiator hoses and clamps (WP 0025, Remove/Install Radiator Hose and Tube Assemblies).
22. Install battery-charging alternator belt (WP 0080, Remove/Install Battery-Charging Alternator Belt).
23. Fill the cooling system (WP 0022, Service Cooling System).
24. Connect camshaft position sensor (WP 0088, Remove/Install Engine ECM Sensors).
25. Install front body panel (WP 0030, Remove/Install Front Body Panel).
26. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
27. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
28. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
29. Repair as required.
30. Dispose of soiled rag IAW local SOP.

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL THERMOSTAT**

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**INITIAL SETUP:****Test Equipment**

Thermometer, Self-Indicating (WP 0179, Table 2, Item 29)

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Assembly, thermostat (WP 0145, Repair Parts List, Figure 40, Item 3)

Connection, water outlet (WP 0145, Figure 40, Item 1)

Antifreeze, ethylene glycol (WP 0180, Expendable and Durable Items List, Item 2)

Brush, wire, scratch, brass (WP 0180, Item 7)

Cap set, protective (WP 0180, Item 8)

Cleaning compound, solvent (WP 0180, Item 11)

Compound, antiseize (WP 0180, Item 14)

Grease, electrically conductive (WP 0180, Item 22)

Rag, wiping (WP 0180, Item 33)

Wire, tie (WP 0180, Item 39)

**Personnel Required**

91D (1)

**Equipment Conditions**

Engine control switch OFF (TM 9 6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Cooling system drained (WP 0022, Service Cooling System)

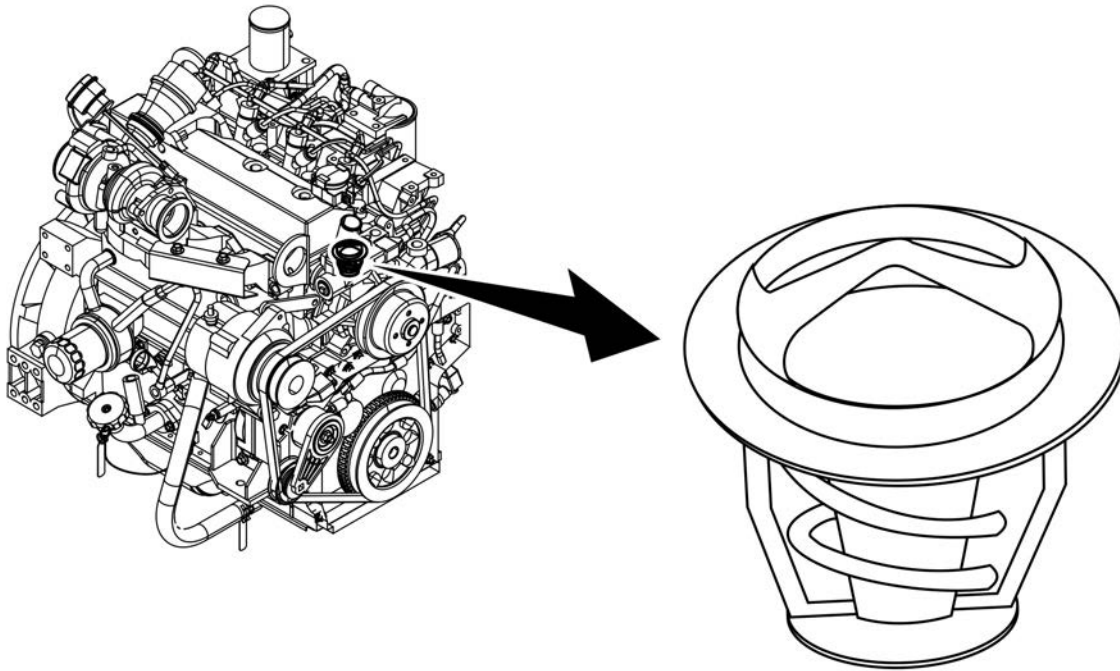
Front body panel removed (WP 0030, Remove/Install Front Body Panel)

Upper radiator hose removed (WP 0025, Remove/Install Radiator Hose and Tube Assemblies)

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**REMOVE/INSTALL THERMOSTAT****Remove Thermostat**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate thermostat (thermostat housing) on front of engine (Figure 1).
3. Place wiping rags under thermostat housing (Figure 2, Item 2) to catch spilled coolant.



**Figure 1. Thermostat — Location.**

4. Remove two cap screws (Figure 2, Item 1) securing thermostat housing (Figure 2, Item 2) to water pump (Figure 2, Item 5).

#### **NOTE**

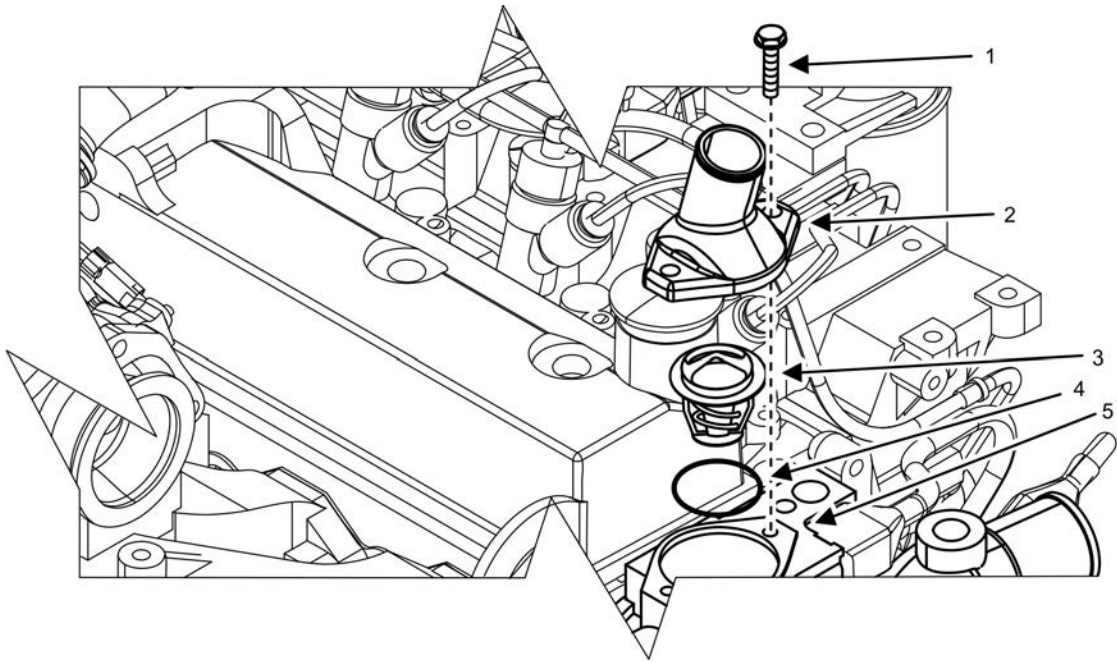
It may be necessary to tap thermostat housing (Figure 2, Item 2) with rubber hammer in order to separate from water pump (Figure 2, Item 5).

5. Remove thermostat housing (Figure 2, Item 2) from water pump (Figure 2, Item 5). Set aside for reuse.
6. Remove thermostat (Figure 2, Item 3) and seal (Figure 2, Item 4) from water pump (Figure 2, Item 5). Discard seal (Figure 2, Item 4).

#### **CAUTION**

Do not let dirt or debris fall into the cooling system. Failure to comply may cause damage to equipment.

7. Plug or cover thermostat cavity on water pump (Figure 2, Item 5).



**Figure 2. Thermostat — Removal/Installation.**

### **WARNING**

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

### **CAUTION**

Do not allow any gasket residue to enter cooling system. Do not damage sealing surface when scraping excess gasket material. Failure to comply may cause damage to equipment.

8. Clean mounting surface on thermostat housing (Figure 2, Item 2) and water pump (Figure 2, Item 5) using dry cleaning solvent, brush, and wiping rags.

### **END OF TASK**

#### **Inspect Thermostat**

1. Inspect thermostat (Figure 2, Item 3) for obvious signs of damage.

### **NOTE**

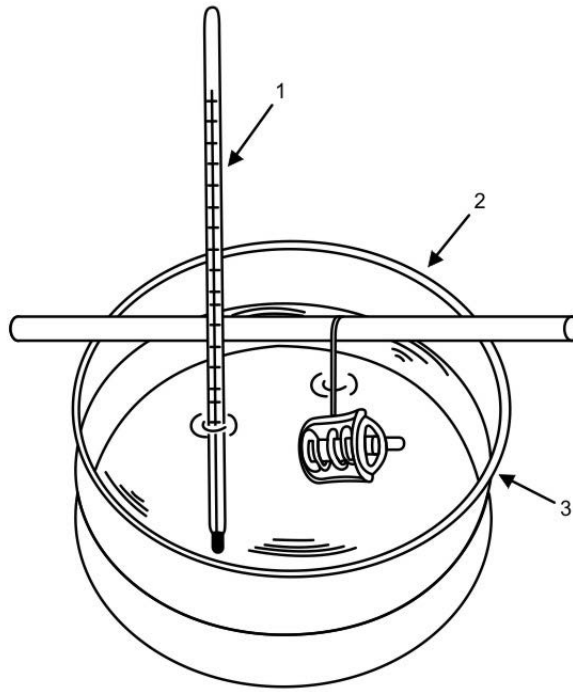
Thermostat (Figure 2, Item 3) assembly comes with new seal (Figure 2, Item 4).

2. Replace thermostat (Figure 2, Item 3) if damaged.

3. Inspect thermostat housing (Figure 2, Item 2) for obvious signs of damage.
4. Replace thermostat housing (Figure 2, Item 2) if damaged.

## END OF TASK

### Test Thermostat



**Figure 3. Thermostat — Test.**

## WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with hands and exposed skin after components have been heated. Wear additional protective clothing as required. Failure to comply may cause injury or death to personnel.

## NOTE

Ensure thermometer is submerged at least 2 in (5.08 cm) in the water, but not touching sides or bottom of container.

1. Suspend thermostat (Figure 3, Item 3) and an accurate thermometer (Figure 3, Item 1) in container (Figure 3, Item 2) of water.
2. Apply heat to container (Figure 3, Item 2) gradually using an outside heat source.

**NOTE**

Thermostat (Figure 3, Item 3) should begin to open when water temperature reaches 176.6°F – 182°F (77°C – 83.3°C). Thermostat (Figure 3, Item 3) should be fully open when water temperature reaches 195°F (90.5°C).

3. Note temperature when thermostat (Figure 3, Item 3) begins to open. Compare to specifications.
4. Continue to apply heat to container (Figure 3, Item 3).

**NOTE**

Thermostat (Figure 3, Item 3) should begin to open when water temperature reaches 176.6°F – 182°F (77°C – 83.3°C). Thermostat (Figure 3, Item 3) should be fully open when water temperature reaches 195°F (90.5°C).

5. Note temperature when thermostat (Figure 3, Item 3) opens fully. Compare to specifications.
6. Replace thermostat (Figure 3, Item 3) if thermostat (Figure 3, Item 3) does not react IAW either temperature specification.

**END OF TASK****Install Thermostat**

1. Clean mating surface on thermostat housing (Figure 2, Item 2) and water pump (Figure 2, Item 5) using wiping rags.
2. Remove plug or cover from water pump (Figure 2, Item 5) cavity.

**CAUTION**

Do not let dirt or debris fall into the cooling system. Failure to comply may cause damage to equipment.

**NOTE**

Ensure a new seal (Figure 2, Item 4) is installed each time a new thermostat (Figure 2, Item 3) is installed.

3. Install new seal (Figure 2, Item 4) into water pump (Figure 2, Item 5) cavity.

**CAUTION**

Install the long end of the thermostat (Figure 2, Item 3) into the water pump (Figure 2, Item 5). Improper orientation may cause engine over-heating and damage to internal engine components. Failure to comply may cause damage to equipment.

4. Install thermostat (Figure 2, Item 3) into water pump (Figure 2, Item 5). Ensure proper orientation.
5. Position thermostat housing (Figure 2, Item 2) onto the water pump (Figure 2, Item 5) mounting surface and align mounting holes. Ensure proper orientation.
6. Apply coat of anti-seize lubricant to threads of two cap screws (Figure 2, Item 1).
7. Install and tighten two cap screws (Figure 2, Item 1) through thermostat housing (Figure 2, Item 2) and into water pump (Figure 2, Item 5).
8. Install upper radiator hose (WP 0025, Remove/Install Radiator Hose and Tube Assemblies).
9. Fill the cooling system (WP 0022, Service Cooling System).

- 
10. Install front body panel (WP 0030, Remove/Install Front Body Panel).
  11. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
  12. Close all generator set doors.
  13. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
  14. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
  15. Repair as required.
  16. Dispose of soiled rags IAW local SOP.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL STARTER**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179,  
Table 2, Item 31)

**Materials/Parts**

Motor, starting (WP 0148, Repair Parts List, Figure  
43, Item 1)

Washer, lock (WP 0148, Figure 43, Item 2)

Grease, electrically conductive (WP 0180,  
Expendable and Durable Items List, Item 22)

**Personnel Required**

91D (1)

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**References**

WP 0037, Remove/Install Batteries

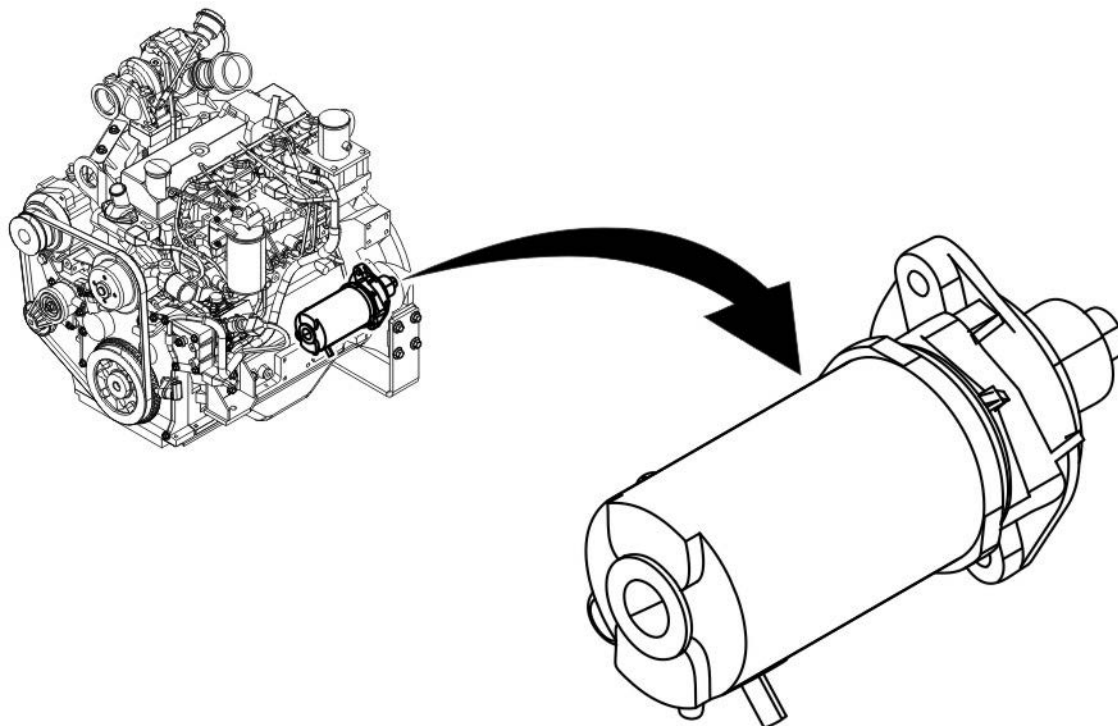
**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10,  
WP 0005)

Engine cool

## REMOVE/INSTALL STARTER

### Remove Starter Assembly



**Figure 1. Starter — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door and locate starter (Figure 1).
3. Remove battery ground cable (WP 0037, Remove/Install Batteries).



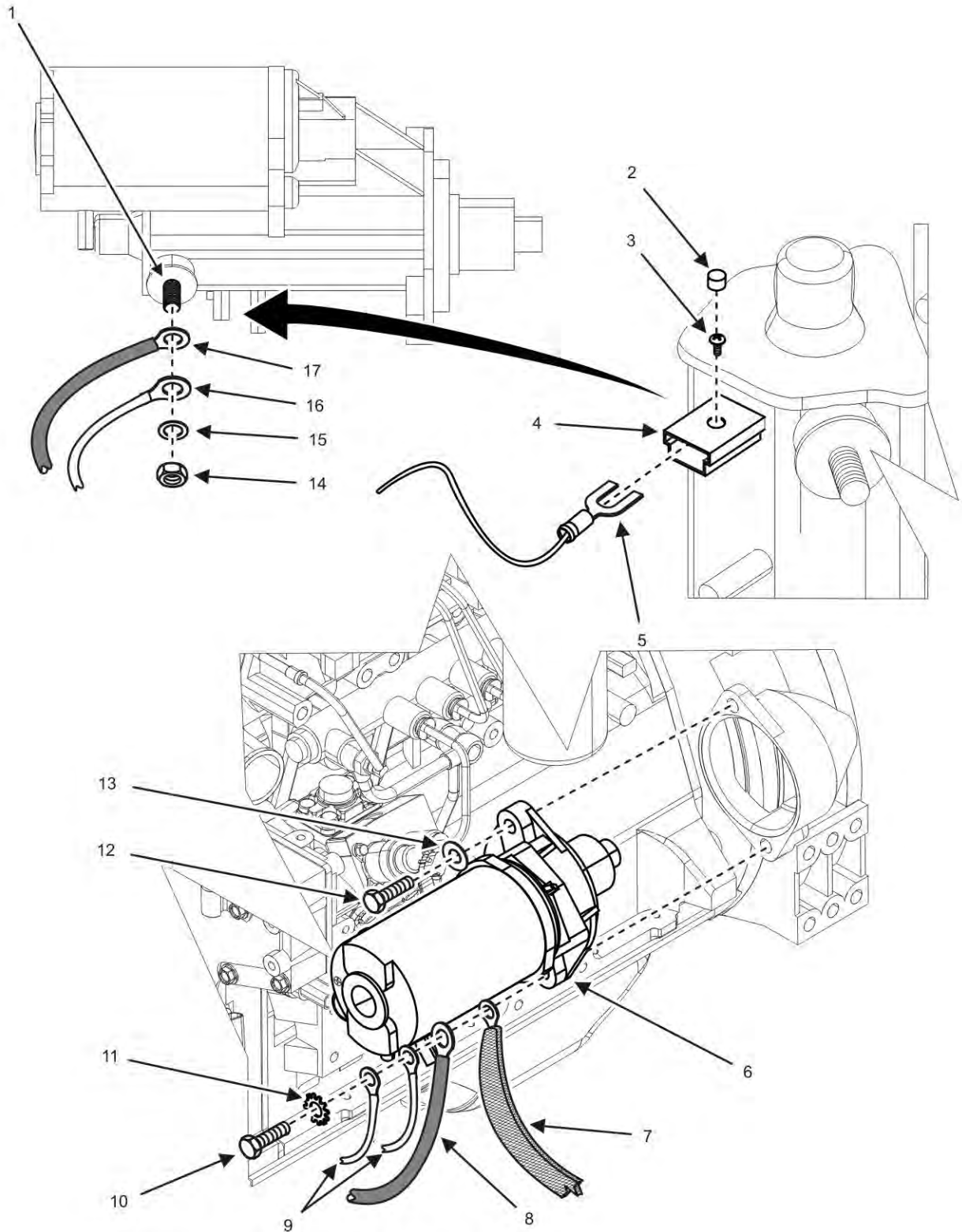


Figure 2. Starter — Removal/Installation.

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**NOTE**

Tag or mark all electrical wires and connectors during removal to aid at installation.

4. Slide protective boot (not shown) away and remove lower mounting screw (Figure 2, Item 10) and lock washer (Figure 2, Item 11) from starter (Figure 2, Item 6). Discard lock washer (Figure 2, Item 11).
5. Tag and remove two white ground wires (Figure 2, Item 9), one black NATO slave receptacle ground wire (Figure 2, Item 8), and one chassis grounding strap (Figure 2, Item 7).
6. Slide protective boot (not shown) away to expose starter terminal stud (Figure 2, Item 1).
7. Remove nut (Figure 2, Item 14) and lock washer (Figure 2, Item 15) from starter terminal stud (Figure 2, Item 1).
8. Remove and tag one white power wire (Figure 2, Item 16) and one black NATO slave receptacle power wire (Figure 2, Item 17) from starter terminal stud (Figure 2, Item 1).
9. Remove cap (Figure 2, Item 2) and loosen screw (Figure 2, Item 3) on control terminal connector (Figure 2, Item 4) and remove and tag control wire (Figure 2, Item 5).
10. Support starter (Figure 2, Item 6) from underneath.
11. Remove starter upper mounting screw (Figure 2, Item 12) and lock washer (Figure 2, Item 13) from starter (Figure 2, Item 6).
12. Remove starter (Figure 2, Item 6) from engine and place on a suitable work surface.

**END OF TASK****Inspect Starter Assembly**

1. Inspect starter (Figure 2, Item 6) for obvious damage.
2. Replace starter (Figure 2, Item 6) if damaged.
3. Inspect hardware for damage, corrosion, or wear. Replace as required.

**END OF TASK****Install Starter Assembly**

1. Position starter (Figure 2, Item 6) to its mounting location on intake side of engine. Ensure starter pinion gear and flywheel ring gear mate properly.
2. Align mounting holes and secure starter (Figure 2, Item 6) to engine by installing upper mounting screw (Figure 2, Item 12) and lock washer (Figure 2, Item 13) finger-tight.

**CAUTION**

Be sure to make the proper electrical connections when installing the starter. Failure to comply may cause damage to equipment.

**NOTE**

Use tags and markings applied during the removal process to aid installation. Remove tags and markings after operational checkout.

3. Place following on lower mounting screw (Figure 2, Item 10):
  - a. New lock washer (Figure 2, Item 11).

- b. Two white ground wires (Figure 2, Item 9).
- c. One black NATO slave receptacle ground wire (Figure 2, Item 8).
- d. One chassis grounding strap (Figure 2, Item 7).
4. Align mounting hole and install lower mounting screw (Figure 2, Item 10) through starter (Figure 2, Item 6) and into engine casing.
5. Tighten starter mounting screws (Figure 2, Items 10 and 12).
6. Position protective boot (not shown) over starter lower mounting screw (Figure 2, Item 10).
7. Install control wire (Figure 2, Item 5) into control terminal connector (Figure 2, Item 4) and tighten screw (Figure 2, Item 3). Ensure control wire (Figure 2, Item 5) is secured and install cap (Figure 2, Item 2).
8. Position white power wire (Figure 2, Item 16) and NATO slave receptacle power wire (Figure 2, Item 17) onto starter terminal stud (Figure 2, Item 1).
9. Install lock washer (Figure 2, Item 15) and nut (Figure 2, Item 14) onto starter terminal stud (Figure 2, Item 1) and tighten nut (Figure 2, Item 14).
10. Position protective boot (not shown) over starter terminal stud (Figure 2, Item 1).
11. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
12. Close left-side door.
13. Turn engine control switch to PRIME & RUN (TM 9 6115-752-10).
14. Start engine and check for proper operation (TM 9 6115-752-10).
15. Repair as required.

## END OF TASK

### Test Starter

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door.
3. Locate starter on intake-side of engine (Figure 1).

## NOTE

When DCS indicates batteries are charged but unit will not crank, check for battery current at starter (Figure 2, Item 6).

4. Check control wire (Figure 2, Item 5) at control terminal connector (Figure 2, Item 4) for approximately 24 VDC (not less than 20.0 VDC) by attaching the positive lead of the multimeter to control wire (Figure 2, Item 5) and the negative lead to mounting screw (Figure 2, Item 10) while assistant operates the DEAD CRANK SWITCH (TM 9-6115-752-10).
5. Turn DEAD CRANK SWITCH to CRANK with help from assistant. Watch for rotation of the harmonic balancer at the water pump end of the engine indicating the starter (Figure 2, Item 6) is operational.

6. Listen for clicking and spinning sounds at starter (Figure 2, Item 6) when DEAD CRANK SWITCH is in the CRANK position and engine does not crank.
7. Replace starter (Figure 2, Item 6) if clicking and spinning sounds are not heard.
8. Close left-side door.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL BATTERY-CHARGING ALTERNATOR**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0179, Table 2, Item 39)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Alternator, battery charging (WP 0147, Repair Parts List, Figure 42, Item 7)

Grease, electrically conductive (WP 0180, Expendable and Durable Items List, Item 22)

Rag, wiping (WP 0180, Item 33)

**Personnel Required**

91D (1)

Assistant (1)

**References**

WP 0018, Repair DCS

WP 0030, Remove/Install Front Body Panel

WP 0037, Remove/Install Batteries

WP 0080, Remove/Install Battery-Charging Alternator Belt

WP 0100, General Maintenance

Foldout Pages

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

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**REMOVE/INSTALL BATTERY-CHARGING ALTERNATOR**
**Test Battery-Charging Alternator****WARNING**

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
- Hearing protection is required during maintenance or repair with engine running. Failure to comply can cause hearing loss.
- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

## WARNING

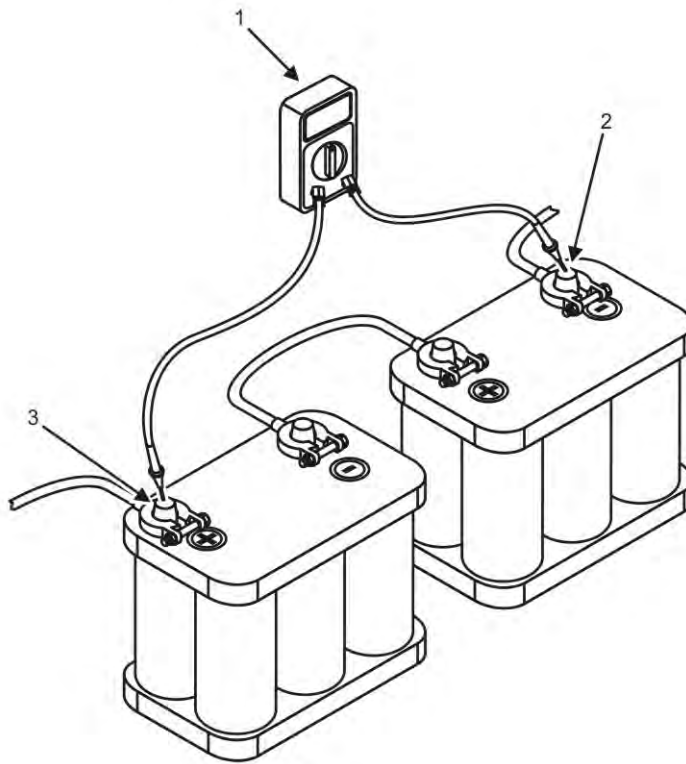
- Exhaust discharge contains deadly gases, including carbon monoxide. Exhaust gases are most dangerous in places with poor ventilation. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented. Failure to comply may cause injury or death to personnel.

## CAUTION

Operating generator set with doors open or with panels removed for an extended length of time will cause engine to overheat. Do not operate generator with doors open or panels removed for longer than necessary to complete your task. Monitor DCS temperature indicator to prevent engine overheating. Failure to comply will cause damage to equipment.

## NOTE

This test is not necessary if you are removing the battery-charging alternator for access to other components.



**Figure 1. Battery-Charging Alternator — Test.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door.
3. Set the multimeter (Figure 1, Item 1) to measure VDC.
4. Attach multimeter (Figure 1, Item 1) to right-side battery negative terminal (Figure 1, Item 2) and left-side battery positive terminal (Figure 1, Item 3).
5. Record voltage reading displayed on the multimeter (Figure 1, Item 1).

6. Ensure battery ground cable is installed (WP 0037, Remove/Install Batteries).
7. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
8. Start generator set (TM 9-6115-752-10).
9. Attach multimeter (Figure 1, Item 1) to terminal stud (Figure 3, Item 6) of M1-T108 + wire (Figure 3, Item 1) and terminal M1-T109 – wire (Figure 3, Item 4) of battery-charging alternator (Figure 3, Item 3).

### NOTE

If voltage at battery-charging alternator (Figure 3, Item 3) with engine operating is not between 26 and 31 V DC range, the battery-charging alternator (Figure 3, Item 3) or field flash plug P15 (Figure 3, Item 5) may be defective. If voltage at battery-charging alternator (Figure 3, Item 3) is within 26 and 31 VDC range, wiring to starter (not shown) can be tested to confirm proper operation (see step 17).

10. Record voltage reading. Proceed to step 11 if voltage is not within 26 to 31 VDC range or proceed to step 17 if voltage is within 26 to 31 VDC range.
11. Shut down generator set (TM 9-6115-752-10).
12. Remove field flash plug P15 (Figure 3, Item 5) from battery-charging alternator (Figure 3, Item 3) and connect multimeter leads from center contact of field flash plug P15 (Figure 3, Item 5) to M1-T109 – wire (Figure 3, Item 4) of battery-charging alternator (Figure 3, Item 3).
13. Use an assistant to start generator set (TM 9-6115-752-10).

### CAUTION

Be sure to observe multimeter display throughout entire starting and running of generator set to obtain an accurate reading. Full field flash voltage reading should be observed within 30 sec of starting. Failure to comply may cause damage to equipment.

### NOTE

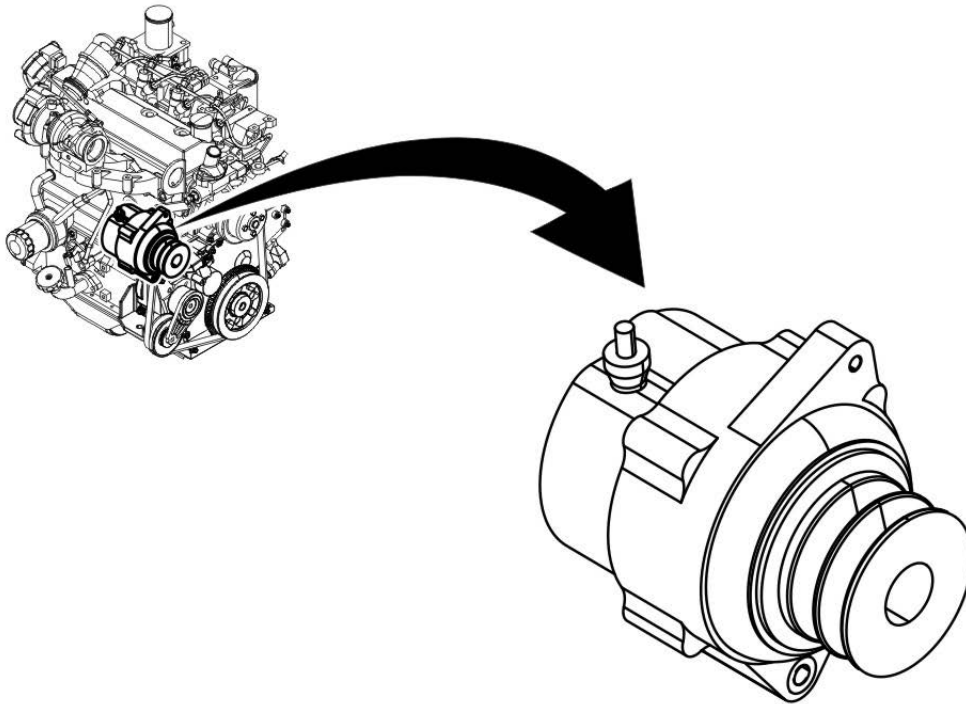
If voltage reading obtained in step 14 is the same  $\pm 5\%$  as battery voltage reading obtained in step 5, battery-charging alternator (Figure 3, Item 3) is receiving proper field flash signal from DCS. If voltage reading obtained in step 14 is not the same  $\pm 5\%$  as battery voltage reading obtained in step 5, field flash plug P15 (Figure 3, Item 5) wire or DCS may be malfunctioning. See WP 0100, General Maintenance and Foldout Pages to check field flash plug P15 (Figure 3, Item 5) wire and see WP 0018, Repair DCS to check DCS.

14. Record voltage reading and compare to reading obtained in step 5.
15. Shut down generator set (TM 9-6115-752-10).
16. Replace battery-charging alternator (Figure 3, Item 3) if voltage recorded in step 10 is outside 26 to 31 VDC range but field flash plug P15 (Figure 3, Item 5) voltage in step 14 is the same as battery voltage (step 5).
17. Attach multimeter (Figure 1, Item 1) to right-side battery negative terminal (Figure 1, Item 2) and left-side battery positive terminal (Figure 1, Item 3).
18. Start generator set (TM 9-6115-752-10).
19. Record voltage reading displayed on the multimeter (Figure 1, Item 1).
20. Shut down generator set (TM 9-6115-752-10).
21. Test and replace wiring as required (WP 0100 and Foldout Pages) if voltage reading in step 19 does not match voltage reading  $\pm 5\%$  obtained in step 10.
22. Remove multimeter (Figure 1, Item 1) from battery terminals.

23. Close left-side door.

## END OF TASK

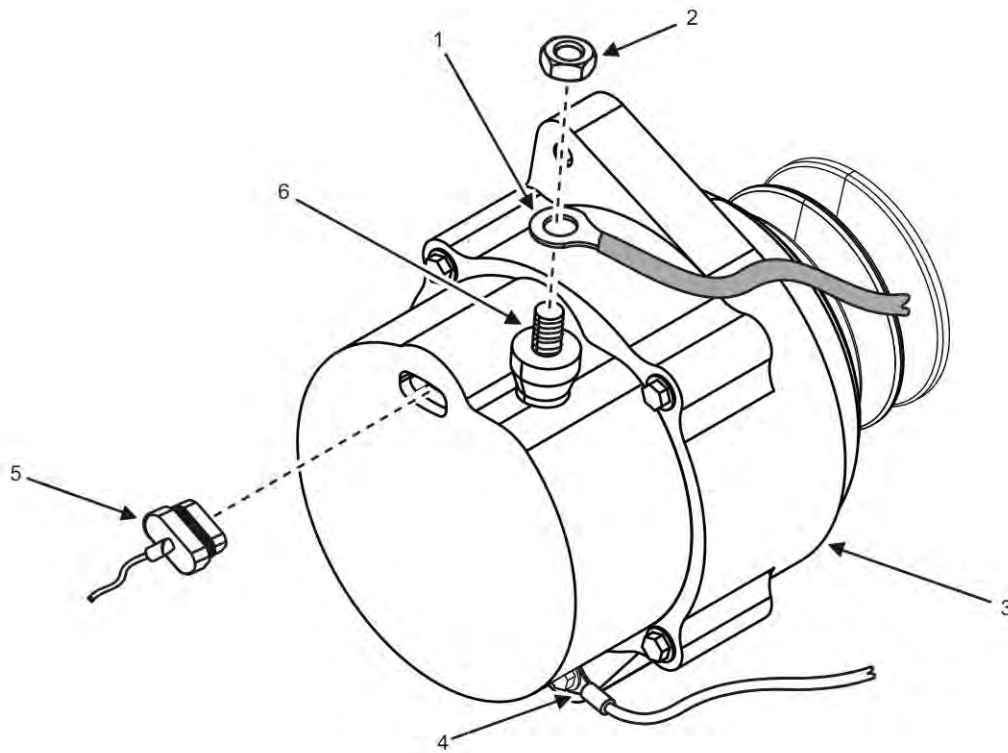
### Remove Battery-Charging Alternator



**Figure 2. Battery-Charging Alternator — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Remove negative ground cable from right-hand battery (WP 0037, Remove/Install Batteries).
3. Open right-side door of generator set and locate battery-charging alternator (Figure 2).
4. Remove access panel (WP 0030, Remove/Install Front Body Panel).
5. Remove battery-charging alternator belt (WP 0080, Remove/Install Battery-Charging Alternator Belt).



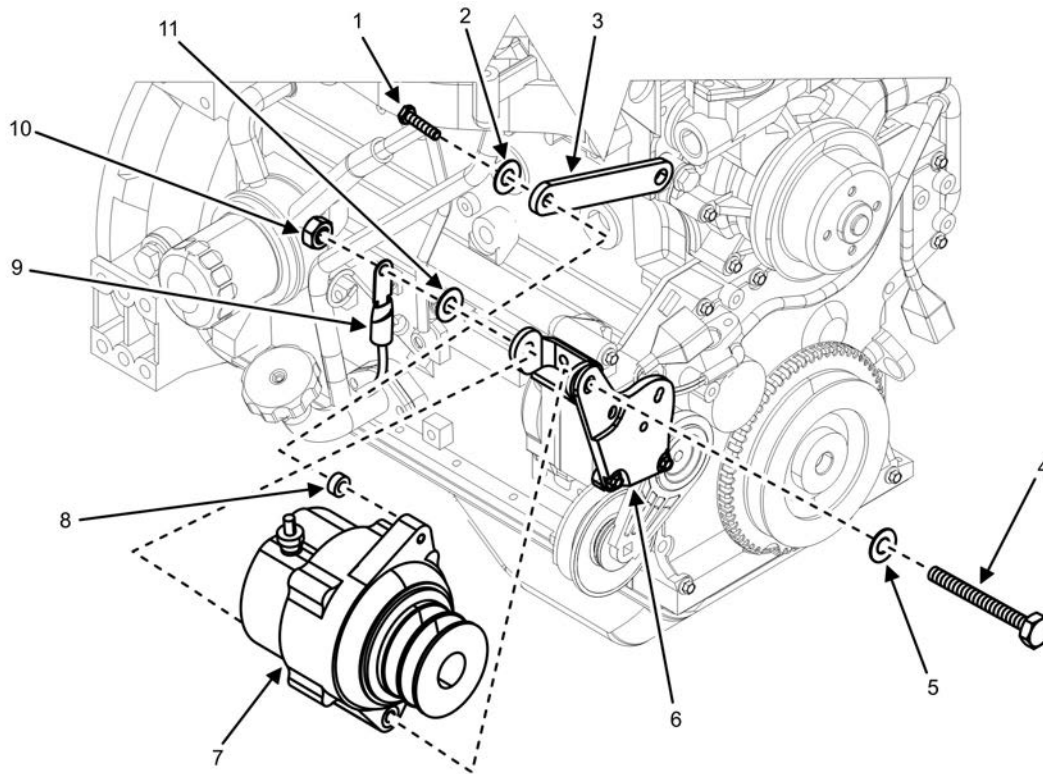


**Figure 3. Battery-Charging Alternator — Electrical Connections.**

**NOTE**

Tag or mark all electrical wires and connectors prior to removal to aid at installation.

6. Tag and disconnect field flash plug P15 (Figure 3, Item 5) from rear of battery-charging alternator (Figure 3, Item 3).
7. Remove protective boot (not shown) to expose terminal stud (Figure 3, Item 6) on battery-charging alternator (Figure 3, Item 3).
8. Remove nut (Figure 3, Item 2) from terminal stud (Figure 3, Item 6).
9. Tag and remove terminal M1-T108 + wire (Figure 3, Item 1) from terminal stud (Figure 3, Item 6).



**Figure 4. Battery-Charging Alternator — Removal.**

10. Remove protective boot (not shown) to expose terminal M1-T109 – wire (Figure 4, Item 11) connected to lower mounting bolt (Figure 4, Item 4).
11. Remove nut (Figure 4, Item 12) from lower mounting bolt (Figure 4, Item 4).
12. Remove M1-T109 – wire (Figure 4, Item 11) and flat washer (Figure 4, Item 13) from lower mounting bolt (Figure 4, Item 4).
13. Support battery-charging alternator (Figure 4, Item 8) and remove upper mounting bolt (Figure 4, Item 1), flat washer (Figure 4, Item 2), and spacer (Figure 4, Item 10) from alternator top mounting bracket (Figure 4, Item 3).
14. Support battery-charging alternator (Figure 4, Item 8) and remove lower mounting bolt (Figure 4, Item 4), one flat washer (Figure 4, Item 5), and two spacers (Figure 4, Items 7 and 9) that secure battery-charging alternator (Figure 4, Item 8) to alternator lower mounting bracket (Figure 4, Item 6).
15. Place battery-charging alternator (Figure 4, Item 8) on suitable work surface.

#### **END OF TASK**

#### **Inspect Battery-Charging Alternator**

1. Inspect battery-charging alternator (Figure 4, Item 8) for obvious damage.
2. Replace battery-charging alternator (Figure 4, Item 8) if damaged.
3. Inspect alternator top mounting bracket (Figure 4, Item 3) and alternator lower mounting bracket (Figure 4, Item 6) for signs of obvious damage. Replace damaged components.

#### **END OF TASK**

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**Install Battery-Charging Alternator****NOTE**

Use tags or markings applied to electrical wires and connector at time of removal as aids during installation. Remove and discard all tags only after operational checkout is complete.

1. Position battery-charging alternator (Figure 4, Item 8) to its mounting location on exhaust side of engine at alternator lower mounting bracket (Figure 4, Item 6).
2. Secure battery-charging alternator (Figure 4, Item 8) to alternator lower mounting bracket (Figure 4, Item 6) by installing lower mounting bolt (Figure 4, Item 4), two flat washers (Figure 4, Item 5 and 13), and two spacers (Figure 4, Items 7 and 9) through alternator lower mounting bracket (Figure 4, Item 6) and battery-charging alternator (Figure 4, Item 8). Ensure proper orientation of lower mounting bolt (Figure 4, Item 4).
3. Install M1-T109 – wire (Figure 4, Item 11) to lower mounting bolt (Figure 4, Item 4).
4. Secure battery-charging alternator (Figure 4, Item 8) to alternator lower mounting bracket (Figure 4, Item 6) by installing nut (Figure 4, Item 12) finger-tight.
5. Position battery-charging alternator (Figure 4, Item 8) to alternator top mounting bracket (Figure 4, Item 3).
6. Position spacer (Figure 4, Item 10) between top mounting bracket (Figure 4, Item 3) and battery-charging alternator (Figure 4, Item 8).
7. Install upper mounting bolt (Figure 4, Item 1) and flat washer (Figure 4, Item 2) finger-tight.
8. Tighten upper mounting bolt (Figure 4, Item 1) to 17 to 21 ft/lb (24 – 29 Nm).
9. Tighten lower mounting bolt (Figure 4, Item 4) to 34 to 42 ft/lb (47 – 71 Nm).
10. Position protective boot (not shown) over M1-T109 – wire (Figure 4, Item 11) connected to lower mounting bolt (Figure 4, Item 4).
11. Install field flash plug P15 (Figure 3, Item 5) to rear of battery-charging alternator (Figure 3, Item 3).
12. Install M1-T108 + wire (Figure 3, Item 1) onto terminal stud (Figure 3, Item 6).
13. Install and tighten nut (Figure 3, Item 2) onto terminal stud (Figure 3, Item 6).
14. Position protective boot (not shown) over terminal stud (Figure 3, Item 6).
15. Install battery-charging alternator belt (WP 0080, Remove/Install Battery-Charging Alternator Belt).
16. Install access panel (WP 0030, Remove/Install Front Body Panel).
17. Close right-side door of generator set.
18. Install battery ground cable (WP 0037, Remove/Install Batteries).
19. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
20. Start engine and check for proper operation (TM 9-6115-752-10).
21. Repair as required.

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL BATTERY-CHARGING ALTERNATOR BELT**

---

**INITIAL SETUP:**

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Belt, V-drive (5/8 inch x 52 inch) (WP 0147, Repair Parts List, Figure 42, Item 11)

Cleaning compound, solvent (WP 0180, Expendable and Durable Items List, Item 11)

Grease, electrically conductive (WP 0180, Item 22)

Rag, wiping (WP 0180, Item 33)

**Personnel Required**

91D (1)

Assistant (1)

**References**

WP 0066, Remove/Install 50/60 Hz Engine Assembly

**References**

WP 0067, Remove/Install 400 Hz Engine Assembly

WP 0076, Remove/Install Water Pump

WP 0079, Remove/Install Battery-Charging Alternator

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Access panel removed (WP 0030, Remove/Install Front Body Panel)

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**REMOVE/INSTALL BATTERY-CHARGING ALTERNATOR BELT**

**WARNING**

High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator set is running. Failure to comply may cause injury or death to personnel.

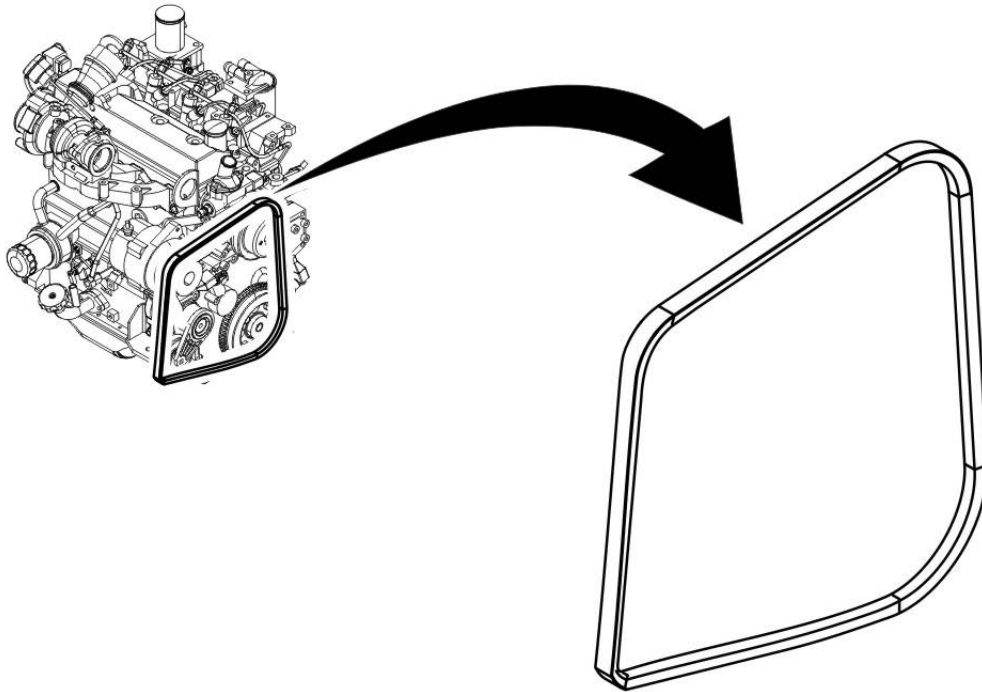
**Remove Battery-Charging Alternator Belt**

Figure 1. Battery-Charging Alternator Belt — Location.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate battery-charging alternator belt (Figure 1).

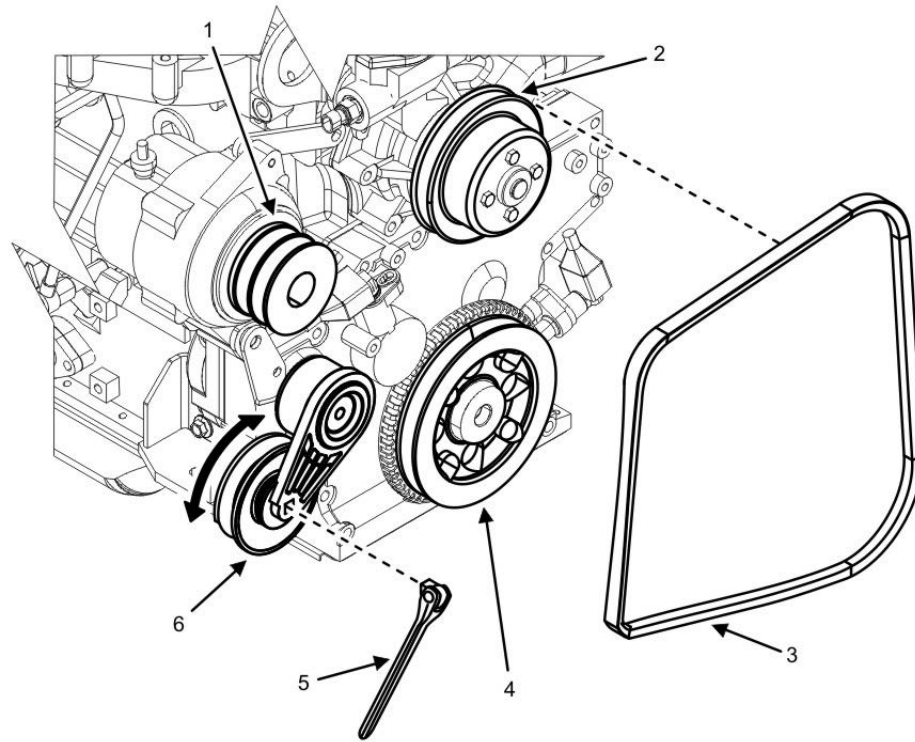


Figure 2. Battery-Charging Alternator Belt — Removal/Installation.

3. Insert a 3/8-drive breaker bar (Figure 2, Item 5) into the belt tensioner (Figure 2, Item 6).
4. Apply downward pressure on the breaker bar (Figure 2, Item 5) and release the tension on the battery-charging alternator belt (Figure 2, Item 3).
5. Remove the battery-charging alternator belt (Figure 2, Item 3) from the belt tensioner (Figure 2, Item 6) pulley.
6. Release belt tensioner (Figure 2, Item 6) pressure slowly and allow belt tensioner (Figure 2, Item 6) to return to neutral position.
7. Remove battery-charging alternator belt (Figure 2 Item 3) from battery-charging alternator pulley (Figure 2, Item 1), water pump pulley (Figure 2, Item 2), and harmonic balancer (Figure 2, Item 4).
8. Remove battery-charging alternator belt (Figure 2, Item 3) from the generator set.

#### END OF TASK

#### Inspect Battery-Charging Alternator Belt

1. Inspect battery-charging alternator belt (Figure 2, Item 3) for cracks or excessive wear.
2. Replace battery-charging alternator belt (Figure 2, Item 3) if cracked or excessively worn.
3. Inspect belt tensioner (Figure 2, Item 6) for signs of obvious damage. Replace damaged belt tensioner. See Remove Battery-Charging Alternator Belt Tensioner task.
4. Inspect battery-charging alternator pulley (Figure 2, Item 1) for signs of damage. Replace battery-charging alternator (WP 0079, Remove/Install Battery-Charging Alternator) if battery-charging alternator pulley (Figure 2, Item 1) is damaged.
5. Inspect water pump pulley (Figure 2, Item 2) for signs of damage. Replace damaged water pump pulley (Figure 2, Item 2) (WP 0076, Remove/Install Water Pump).

6. Inspect harmonic balancer (Figure 2, Item 4) for signs of damage. Replace engine assembly (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly) if harmonic balancer (Figure 2, Item 4) is damaged.

## END OF TASK

### Install Battery-Charging Alternator Belt

1. Place battery-charging alternator belt (Figure 2, Item 3) onto the harmonic balancer (Figure 2, Item 4), water pump pulley (Figure 2, Item 2), and battery-charging alternator pulley (Figure 2, Item 1).
2. Ensure battery-charging alternator belt (Figure 2, Item 3) is positioned in the proper pulley groove at battery-charging alternator pulley (Figure 2, Item 1) and water pump pulley (Figure 2, Item 2).
3. Insert a 3/8-drive breaker bar (Figure 2, Item 5) into the belt tensioner (Figure 2, Item 6).
4. Apply upward pressure on the breaker bar (Figure 2, Item 5) and engage the belt tensioner (Figure 2, Item 6) until the battery-charging alternator belt (Figure 2, Item 3) can be installed onto the belt tensioner (Figure 2, Item 6) pulley.
5. Release the belt tensioner (Figure 2, Item 6) and allow it to increase tension on battery-charging alternator belt (Figure 2, Item 3).
6. Remove breaker bar (Figure 2, Item 5). Ensure the battery-charging alternator belt (Figure 2, Item 3) is not twisted and is seated properly on each pulley.

## END OF TASK

### Install Battery-Charging Alternator Belt Tensioner

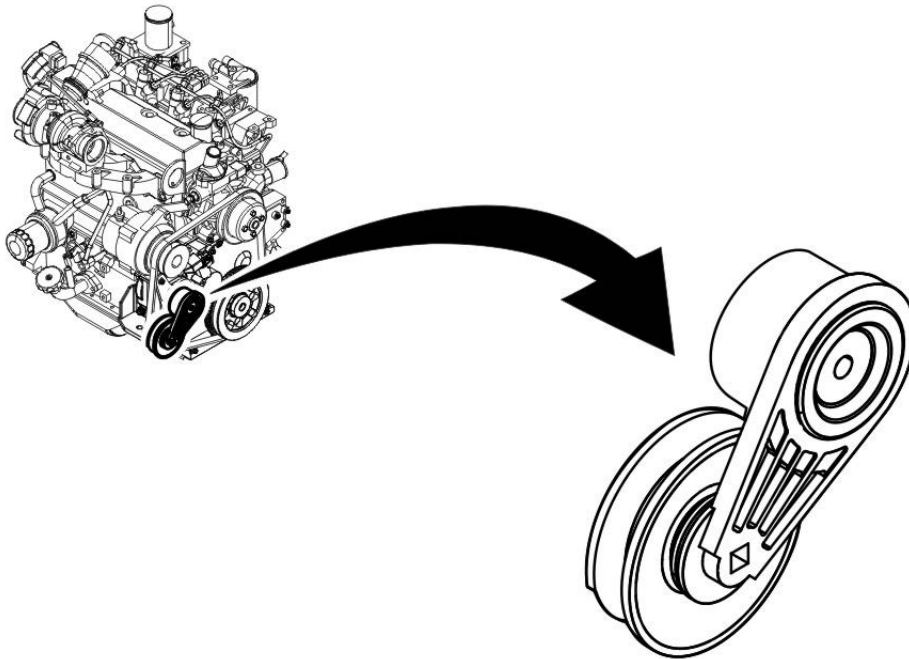


Figure 3. Battery-Charging Alternator Belt Tensioner— Location.

3. Ensure equipment conditions are met in order presented in initial setup.
4. Remove battery-charging alternator belt. See Remove Battery-Charging Alternator Belt task.



5. Locate battery-charging alternator belt tensioner (Figure 3).

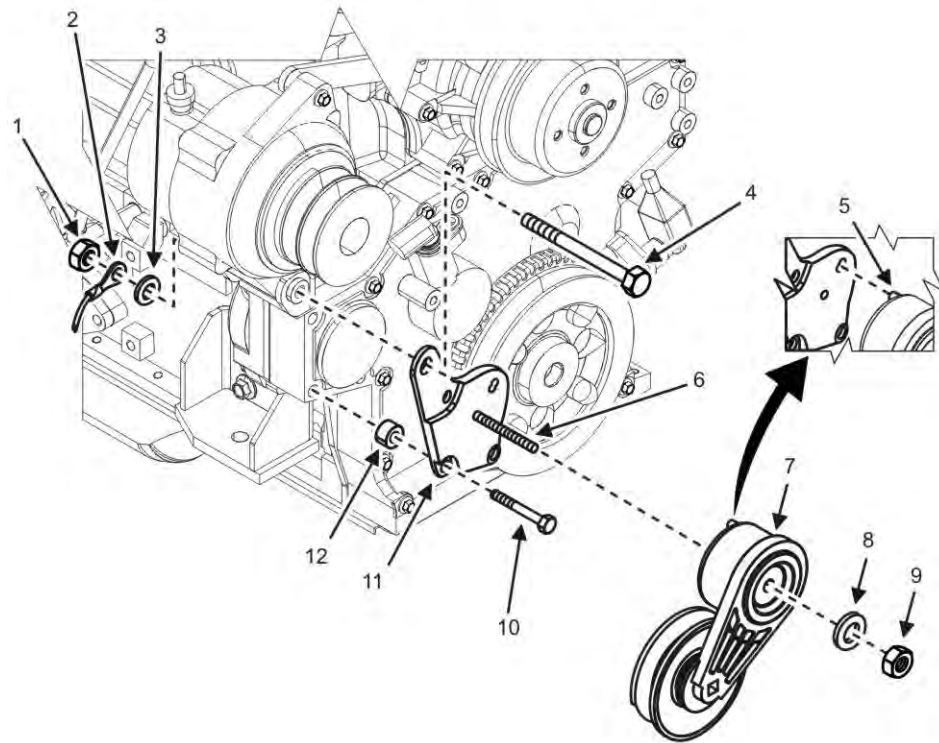


Figure 4. Battery-Charging Alternator Belt Tensioner— Removal/Installation.

6. Remove nut (Figure 4, Item 9) and washer (Figure 4, Item 8) that secure tensioner (Figure 4, Item 7) to stud (Figure 4, Item 6) on tensioner bracket (Figure 4, Item 11).
7. Remove tensioner (Figure 4, Item 7) from tensioner bracket (Figure 4, Item 11).
8. Remove lower mounting bolt (Figure 4, Item 4), two flat washers (Figure 4, Item 3), wire (Figure 4, Item 2), and nut (Figure 4, Item 1) that secures battery-charging alternator to engine.
9. Remove three screws (Figure 4, Item 10) and three spacers (Figure 4, Item 12) that secure tensioner bracket (Figure 4, Item 11) to engine.
10. Remove tensioner bracket (Figure 4, Item 11) from engine.
11. Place tensioner (Figure 4, Item 7) and tensioner bracket (Figure 4, Item 11) on a suitable work surface and retain all mounting hardware for reuse.

## END OF TASK

### Inspect Battery-Charging Alternator Belt Tensioner

1. Inspect tensioner (Figure 4, Item 7) for signs of obvious damage to include: dents to spring case, cracked or bent arm, and damaged pulley.
2. Replace tensioner (Figure 4, Item 7) if damaged.
3. Inspect tensioner bracket (Figure 4, Item 11) for signs of obvious damage.
4. Replace tensioner bracket (Figure 4, Item 11) if damaged.

---

**WARNING**

Cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

5. Clean tensioner (Figure 4, Item 7) and tensioner bracket (Figure 4, Item 11) using cleaning solvent and wiping rags prior to installation.

**END OF TASK****Install Battery-Charging Alternator Belt Tensioner**

1. Position tensioner bracket (Figure 4, Item 11) to its mounting location on engine and secure by installing three screws (Figure 4, Item 10) and three spacers (Figure 4, Item 12) finger-tight.
2. Secure tensioner bracket (Figure 4, Item 11) to battery-charging alternator lower mounting bracket by installing lower mounting bolt (Figure 4, Item 4), two flat washers (Figure 4, Item 3), wire (Figure 4, Item 2), and nut (Figure 4, Item 1) finger-tight.
3. Tighten lower mounting bolt (Figure 4, Item 4) to 34 to 42 ft/lb (47 – 51 Nm).
4. Tighten screws (Figure 4, Item 10) to 17 to 21 ft/lb (24 – 29 Nm).
5. Position tensioner (Figure 4, Item 7) on stud (Figure 4, Item 6) on tensioner bracket (Figure 4, Item 11).
6. Ensure indexing pin (Figure 4, Item 5) on rear of tensioner (Figure 4, Item 7) is installed properly into mounting hole in tensioner bracket (Figure 4, Item 11).
7. Install tensioner (Figure 4, Item 7) to stud (Figure 4, Item 6) on tensioner bracket (Figure 4, Item 11) with washer (Figure 4, Item 8) and nut (Figure 4, Item 9).
8. Tighten nut (Figure 4, Item 9) to 35 – 42 ft/lb (47 – 57Nm).
9. Install battery-charging alternator belt. See Remove Battery-Charging Alternator Belt task.
10. Install access panel (WP 0030, Remove/Install Front Body Panel).
11. Install battery ground cable (WP 0037, Remove/Install Batteries).
12. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
13. Start engine and check for proper operation (TM 9-6115-752-10).
14. Repair as required.

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL ENGINE ECM**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB (WP 0179, Table 2, Item 41)

**Materials/Parts**

Module, electronic control (WP 0154, Repair Parts List, Figure 49, Item 1)

Cleaning compound, electrical contact (WP 0180, Expendable and Durable Items List, Item 9)

Cloth, cleaning, electronics (WP 0180, Item 13)

Grease, electrically conductive (WP 0180, Item 22)

Rag, wiping (WP 0180, Item 33)

**Personnel Required**

91D (1)

**References**

WP 0087, Remove/Install Engine ECM Wiring Harness

WP 0100, General Maintenance

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**Equipment Conditions**

Engine control switch OFF (TM 9 6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Top body panel removed (WP 0029, Remove/Install Top Body Panel)

Intake air hose removed from air cleaner to turbocharger (WP 0019, Remove/Install Air Intake Hose Assemblies)

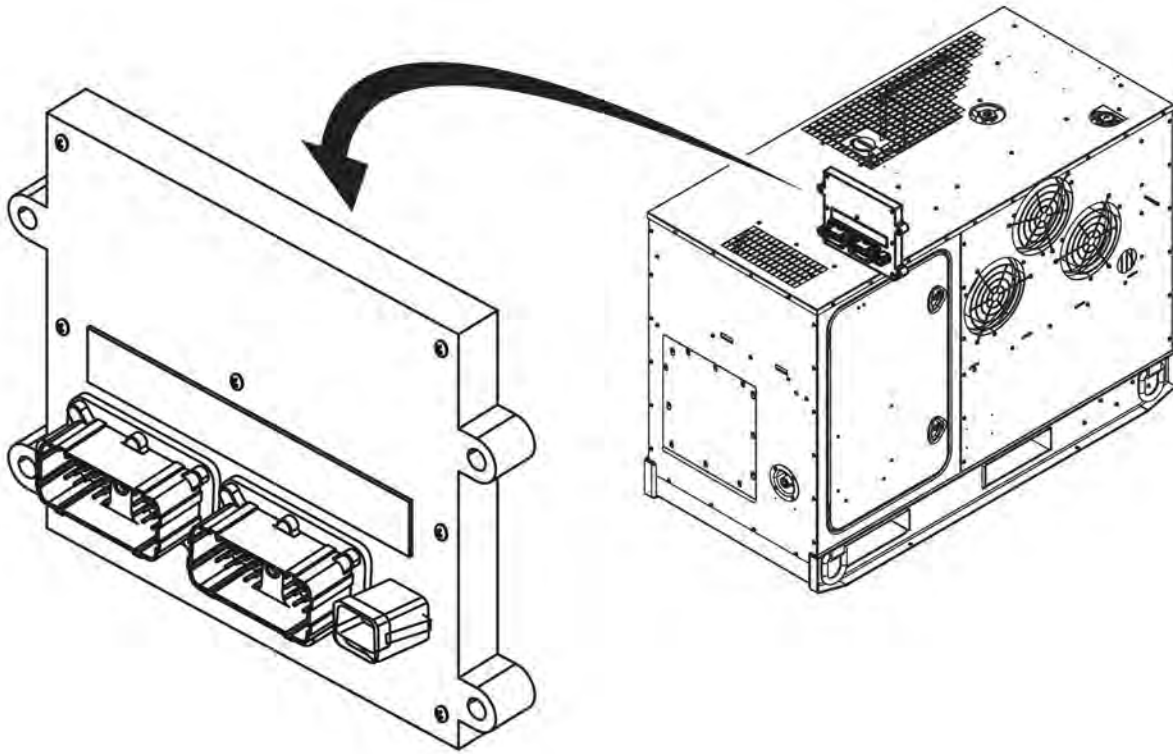
Intake air hose from unit bulkhead to intake air heater removed (WP 0019, Remove/Install Air Intake Hose Assemblies)

---

**REMOVE/INSTALL ENGINE ECM****WARNING**

Cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

## Remove Engine ECM



**Figure 1. Engine ECM — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door.
3. Clean loose dirt and debris from the area around engine ECM (Figure 1) using electrical contact cleaner.

### CAUTION

Cap or seal all open electrical connections to prevent moisture, dust, and debris from entering. Ensure that connector pins are not bent during removal or assembly. Failure to comply will cause damage to equipment.

### NOTE

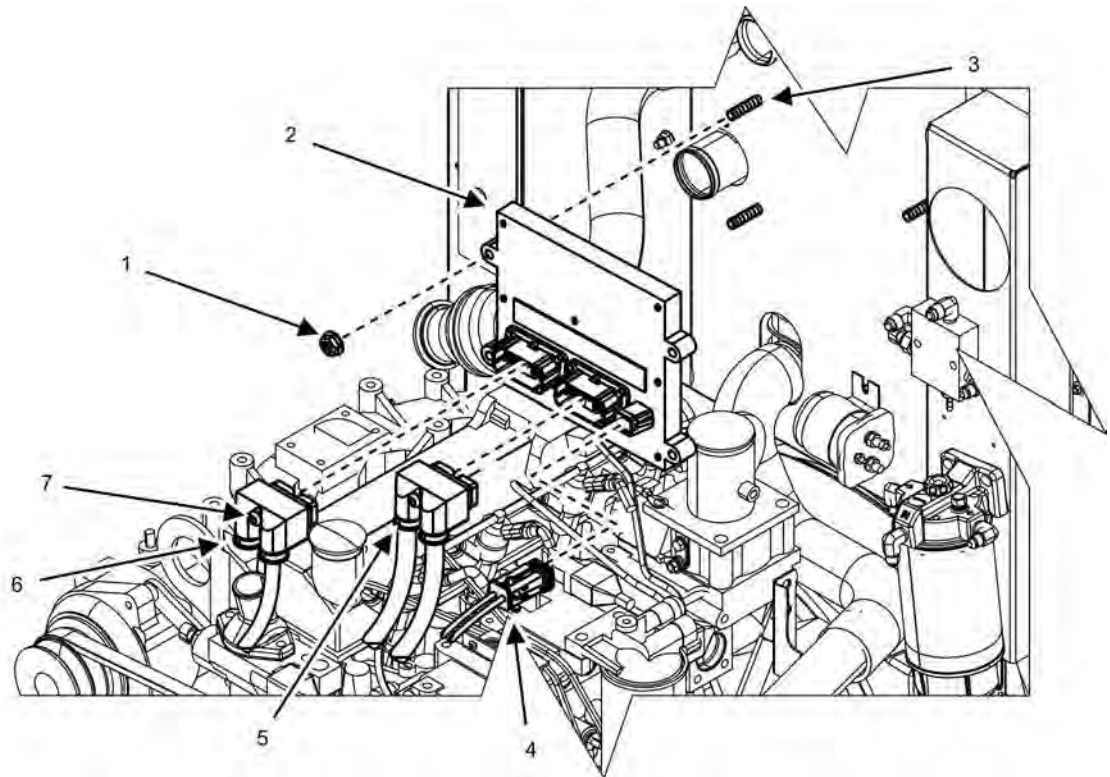
Prior to removal, mark all electrical cables, wires, and connectors to provide a guide for installation.

4. Remove four mounting nuts (Figure 2, Item 1) that secure ECM (Figure 2, Item 2) to unit bulkhead studs (Figure 2, Item 3).
5. Remove power electrical connector (Figure 2, Item 4) from ECM (Figure 2, Item 2).

6. Remove two multipin electrical connectors (Figure 2, Items 5 and 6) from ECM (Figure 2, Item 2) by loosening two captive screws (Figure 2, Item 7) and pulling multipin electrical connectors (Figure 2, Items 5 and 6) from ECM (Figure 2, Item 2).
7. Remove ECM (Figure 2, Item 2) from generator set and place on a suitable work surface.

#### END OF TASK

#### Inspect Engine ECM



**Figure 2. Engine ECM — Removal.**

1. Clean the outside surface of ECM (Figure 2, Item 2) with electrical contact cleaner.
2. Inspect ECM (Figure 2, Item 2) visually for broken connector pins, cracks, signs of overheating, and other obvious damage.
3. Replace ECM (Figure 2, Item 2) if damaged.
4. Inspect power electrical connector (Figure 2, Item 4) on wiring harness visually for cracked insulation, broken pins, signs of overheating, and other obvious damage.
5. Repair power electrical connector (Figure 2, Item 4) (WP 0100, General Maintenance) if damaged.
6. Inspect multipin electrical connectors (Figure 2, Items 5 and 6) on engine and ECM wiring harnesses visually for cracked insulation, broken pins, signs of overheating, and other obvious damage.
7. Repair electrical connector (Figure 2, Item 6) (WP 0100, General Maintenance) if damaged.
8. Replace ECM wiring harness (WP 0087, Remove/Install Engine ECM Wiring Harness) if connector (Figure 2, Item 5) is damaged.

#### END OF TASK

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**Install Engine ECM****NOTE**

The surface of the ECM (Figure 2, Item 2) that contacts unit bulkhead must remain clean and uncoated to allow maximum efficiency.

1. Position ECM (Figure 2, Item 2) to mounting location on unit bulkhead studs (Figure 2, Item 3).

**CAUTION**

Ensure that connectors are free of dust and debris. Ensure that connector pins are not bent during removal or assembly. Failure to comply will cause damage to equipment.

**NOTE**

Remove caps/seals placed on connectors during disassembly.

2. Apply electrically conductive grease to all electrical connectors (Figure 2, Items 4, 5, and 6).
3. Install two multipin electrical connectors (Figure 2, Items 5 and 6) to ECM (Figure 2, Item 2) using the markings applied during removal as a guide.
4. Secure multipin electrical connectors (Figure 2, Items 5 and 6) to ECM (Figure 2, Item 2) with captive screws (Figure 2, Item 7).
5. Install power electrical connector (Figure 2, Item 4) to ECM (Figure 2, Item 2).
6. Secure ECM (Figure 2, Item 2) to unit bulkhead studs (Figure 2, Item 3) by installing four mounting nuts (Figure 2, Item 1) finger-tight.
7. Tighten ECM mounting nuts (Figure 2, Item 1) to 17.7 ft/lb (24.0 Nm).
8. Install intake air hoses to air cleaner, turbocharger, unit bulkhead, and intake air heater (WP 0019, Remove/Install Air Intake Hose Assemblies).
9. Install top body panel (WP 0029, Remove/Install Top Body Panel).
10. Close left-side door.
11. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
12. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
13. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
14. Repair as required.

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL INTAKE AIR HEATER**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179,  
Table 2, Item 31)

**Materials/Parts**

Gasket, connection (2) (WP 0149, Repair Parts List,  
Figure 44, Item 5)

Heater, intake air (WP 0149, Figure 44, Item 1)

Grease, electrically conductive (WP 0180,  
Expendable and Durable Items List, Item 22)

**Personnel Required**

91D (1)

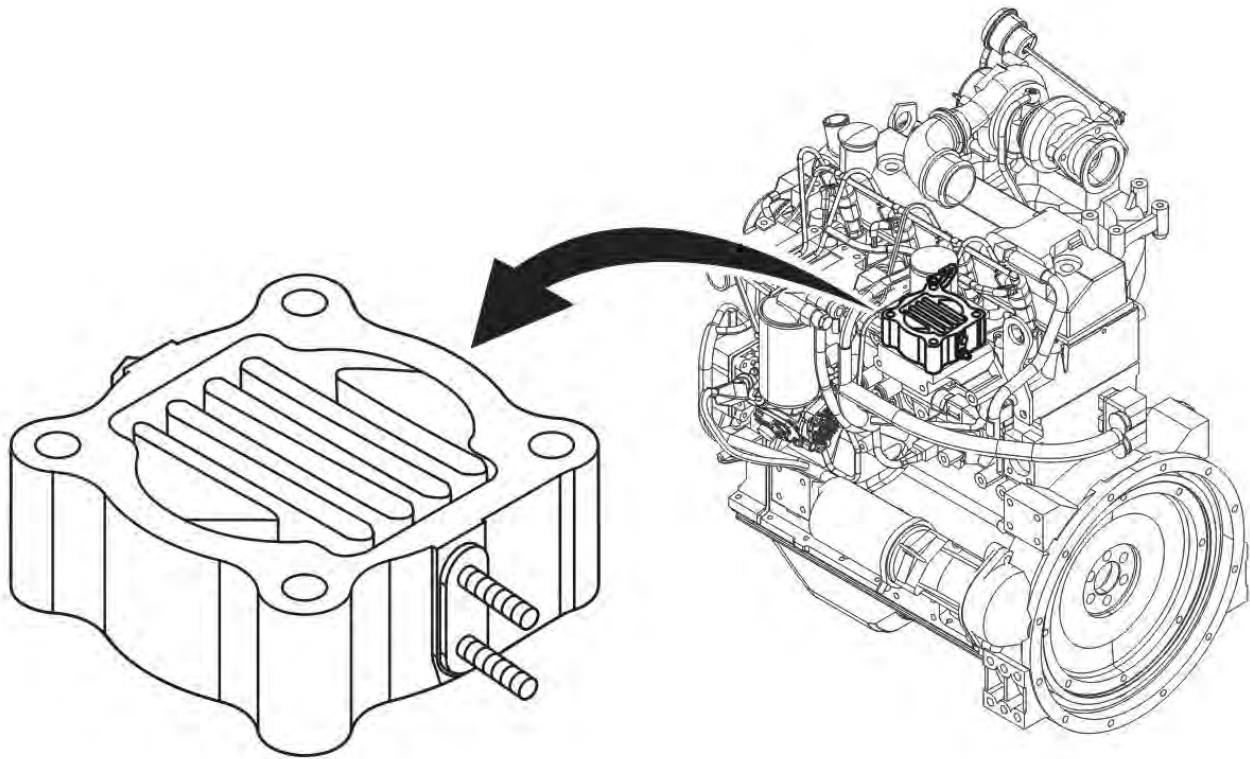
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**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10,  
WP 0005)

Engine cool

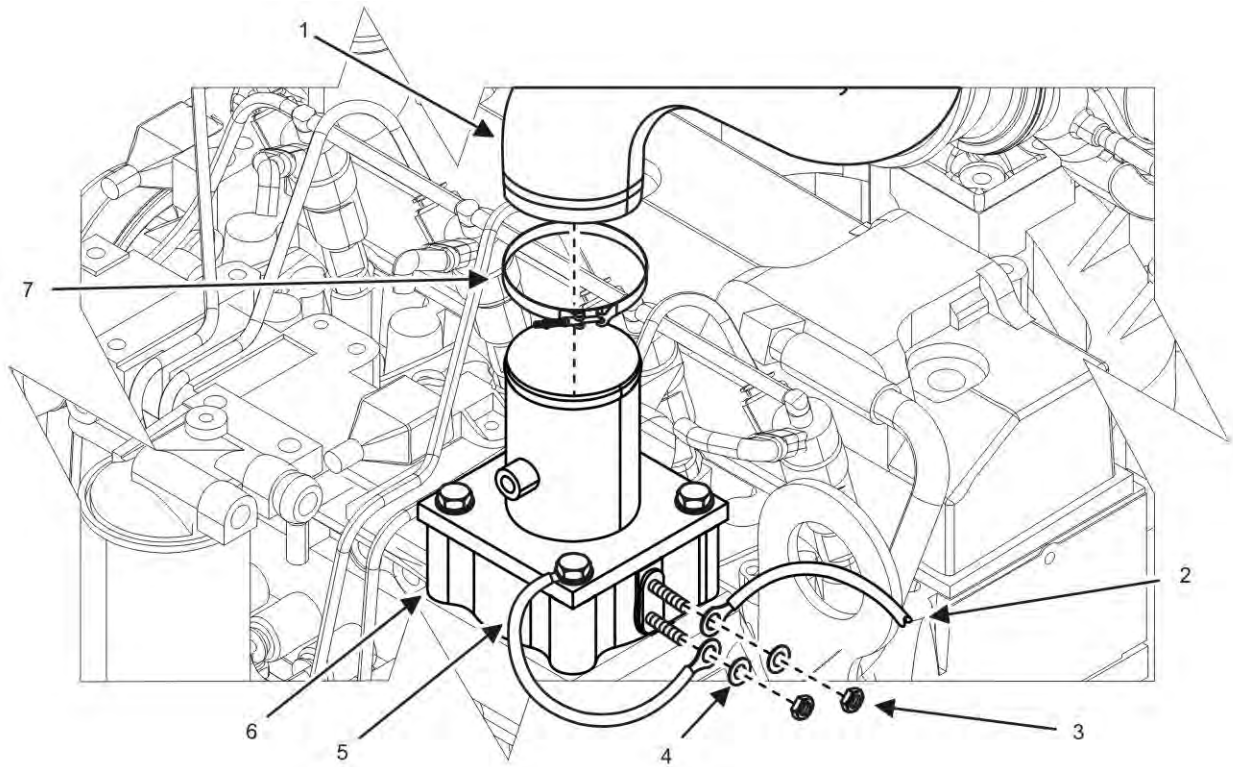
Battery ground cable removed (WP 0037,  
Remove/Install Batteries)

**REMOVE/INSTALL INTAKE AIR HEATER****Remove Intake Air Heater**

**Figure 1. Intake Air Heater — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door on generator set and locate intake air heater (Figure 1).





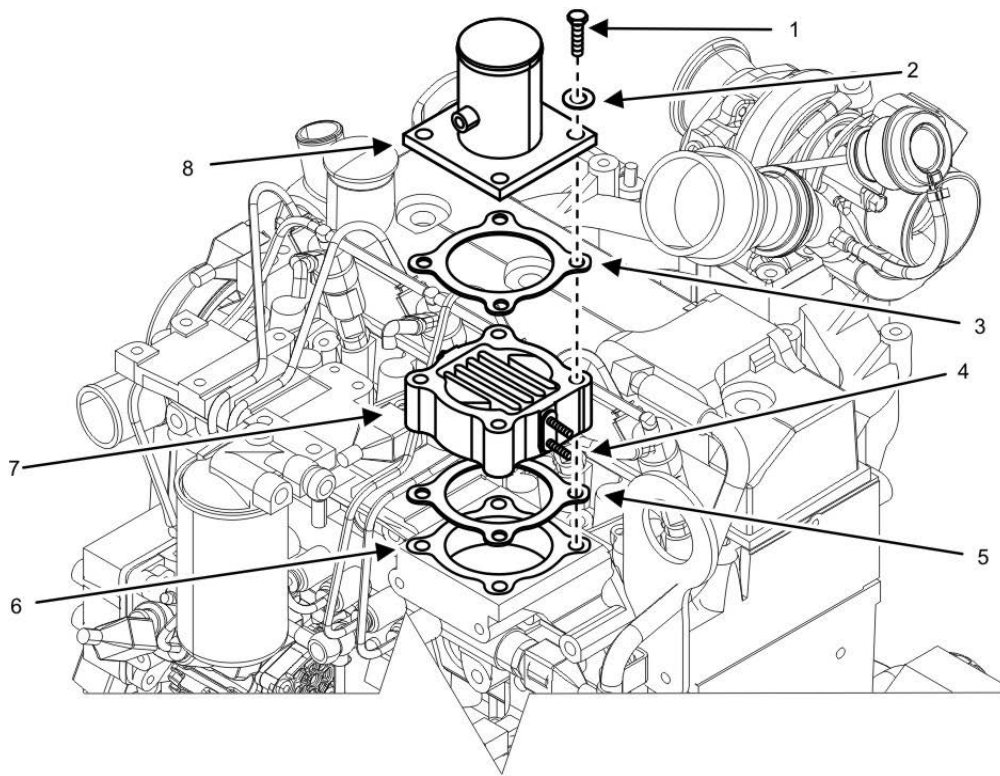
**Figure 2. Intake Air Crossover — Removal.**

3. Loosen clamp (Figure 2, Item 7) from intake air hose (Figure 2, Item 1).
4. Remove intake air hose (Figure 2, Item 1) from intake air heater assembly (Figure 2, Item 6).
5. Inspect intake air hose (Figure 2, Item 1) for signs of obvious damage. Replace intake air hose (Figure 2, Item 1) as required.

#### **NOTE**

Tag or mark all electrical wires and connectors during removal to aid in installation.

6. Remove two nuts (Figure 2, Item 3) and two lock washers (Figure 2, Item 4) that secure two wires (Figure 2, Items 2 and 5) to intake air heater assembly (Figure 2, Item 6). Wire (Figure 2, Item 5) remains attached to intake air heater assembly (Figure 2, Item 6). Discard lock washers (Figure 2, Item 4).



**Figure 3. Intake Air Heater — Detail.**

7. Remove four mounting screws (Figure 3, Item 1) and four lock washers (Figure 3, Item 2) that secure intake air heater assembly (Figure 2, Item 6). Discard four lock washers (Figure 3, Item 2).

### **NOTE**

Tag or mark all electrical wires and connectors during removal to aid at installation.

8. Remove ground wire (Figure 2, Item 5) from respective mounting bolt (Figure 3, Item 1).
9. Remove air crossover adapter (Figure 3, Item 8) from intake air heater (Figure 3, Item 7).
10. Remove and discard gasket (Figure 3, Item 3).
11. Remove intake air heater (Figure 3, Item 7) and gasket (Figure 3, Item 5) from intake manifold (Figure 3, Item 6). Discard gasket (Figure 3, Item 5).

**END OF TASK**

---

**Inspect Intake Air Heater**

1. Inspect intake air heater (Figure 3, Item 7) for dirt, debris, or any blockage.
2. Remove dirt, debris, or any blockage from intake air heater (Figure 3, Item 7).
3. Inspect intake air heater (Figure 3, Item 7) for any damage or missing parts.
4. Replace intake air heater (Figure 3, Item 7) if any damage is found.
5. Inspect intake air heater terminals (Figure 3, Item 4) for any damage.
6. Replace intake air heater (Figure 3, Item 7) if terminal damage is found.

**END OF TASK****Test Intake Air Heater****NOTE**

Intake air heater may be tested while installed on generator set. Remove electrical wires (Figure 2, Items 2 and 5) prior to testing intake air heater.

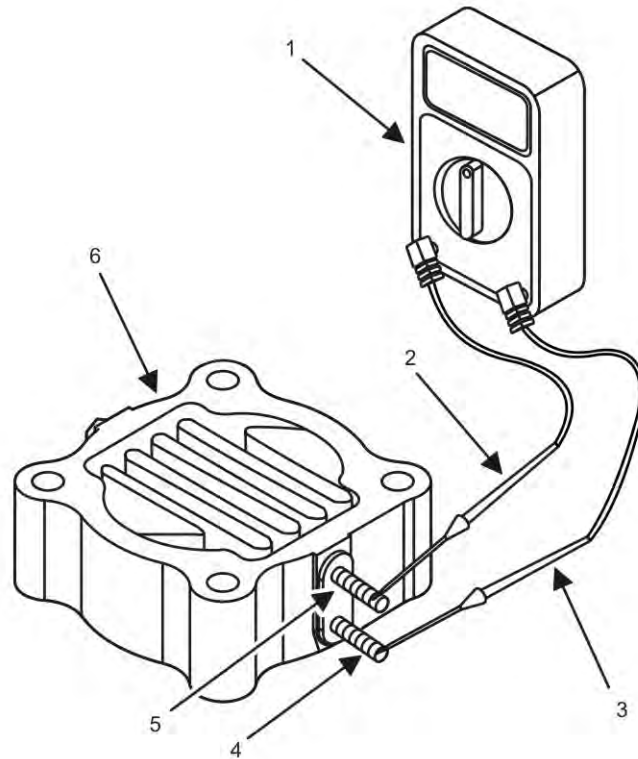
The intake air heater is designed to activate when engine temperature is 21°F – -25°F (-6°C – -32°C). When heater is activated, the absence of voltage at the heater indicates a fault within the 24-VDC electrical system.

An open circuit between the intake air heater terminals will be indicated by a resistance value of infinity. A value of 0 Ohms between the metal frame of the intake air heater and intake air heater terminal will indicate a short to ground. A continuity test with a multimeter selected for Ohms scale may be performed with intake air heater installed or removed.

1. Remove negative ground cable from right-hand battery (WP 0037, Remove/Install Batteries) if battery is not already disconnected.
2. Open left-side door if intake air heater (Figure 1) will be tested while installed.

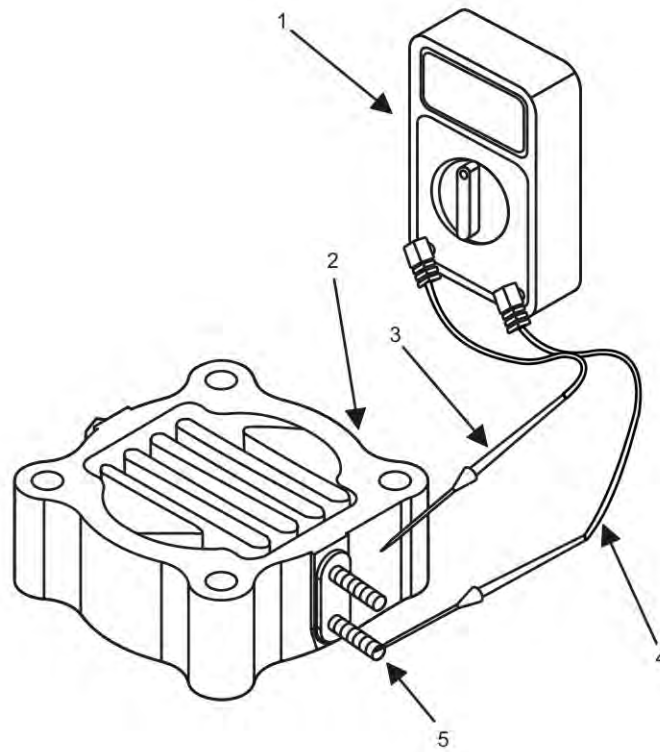
**NOTE**

Ensure multimeter has been properly calibrated. When testing, allow reading on multimeter to stabilize before recording value. A closed or complete circuit of an operable heater will display a resistance value of 0.5 – 1.0 Ohms.



**Figure 4. Intake Air Heater — Test 1.**

3. Use a multimeter (Figure 4, Item 1) selected for Ohms scale to measure resistance between two intake air heater terminals (Figure 4, Items 4 and 5) on intake air heater (Figure 4, Item 6) by placing meter leads (Figure 4, Item 2 and 3) on each intake air heater terminal (Figure 4, Items 4 and 5).
4. Replace intake air heater (Figure 4, Item 6) if resistance value obtained in step 3 is more than 1.0 Ohm.



**Figure 5. Intake Air Heater — Test 2.**

5. Measure insulation resistance using a multimeter (Figure 5, Item 1) by placing meter lead (Figure 5, Item 4) on one terminal (Figure 5, Item 5) and meter lead (Figure 5, Item 3) on metal frame of intake air heater (Figure 5, Item 2).
6. Replace intake air heater (Figure 5, Item 2) if resistance value obtained in step 5 is less than 1 Ohm.

#### **END OF TASK**

#### **Install Intake Air Heater**

1. Position new intake air heater gasket (Figure 3, Item 5) on intake manifold (Figure 3, Item 6).
2. Position intake air heater (Figure 3, Item 7) on gasket (Figure 3, Item 5). Ensure proper orientation of intake air heater (Figure 3, Item 7).
3. Position new air crossover adapter gasket (Figure 3, Item 3) on intake air heater (Figure 3, Item 7).
4. Position air crossover adapter (Figure 3, Item 8) on intake air heater (Figure 3, Item 7).
5. Align all mounting holes with intake air manifold (Figure 3, Item 6) mounting holes.
6. Install three mounting bolts (Figure 3, Item 1) and three new lock washers (Figure 3, Item 2) through air crossover adapter (Figure 3, Item 8), intake air heater (Figure 3, Item 7), two gaskets (Figure 3, Items 3 and 5), and into intake manifold (Figure 3, Item 6) finger-tight.

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**NOTE**

Use tags and markings applied during the removal process to aid installation. Remove tags and markings after operational checkout.

7. Install ground wire (Figure 2, Item 5) and one new lock washer (Figure 3, Item 2) onto fourth mounting bolt (Figure 3, Item 1) and install mounting bolt (Figure 3, Item 1) through air crossover adapter (Figure 3, Item 8), intake air heater (Figure 3, Item 7), and into intake manifold (Figure 3, Item 6) finger-tight.
8. Tighten all four mounting bolts (Figure 3, Item 1) installed in steps 6 – 7.
9. Position opposite end of ground wire (Figure 2, Item 5) onto intake air heater lower grounding terminal (Figure 3, Item 4).
10. Install new lock washer (Figure 2, Item 4) and nut (Figure 2, Item 3) on intake air heater lower grounding terminal (Figure 3, Item 4) and tighten.
11. Install power wire (Figure 2, Item 2) ring connector onto intake air heater assembly (Figure 2, Item 6) upper terminal.
12. Install new lock washer (Figure 2, Item 4) and nut (Figure 2, Item 3) onto intake air heater assembly (Figure 2, Item 6) upper terminal and tighten.
13. Install protective boot (not shown) over intake air heater (Figure 2, Item 6) upper terminal.
14. Position clamp (Figure 2, Item 7) on intake air hose (Figure 2, Item 1).
15. Install intake air hose (Figure 2, Item 1) on intake air heater assembly (Figure 2, Item 6).
16. Position and tighten clamp (Figure 2, Item 7) over intake air heater assembly (Figure 3, Item 6).
17. Close left-side door.
18. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
19. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
20. Start engine and check for proper operation (TM 9-6115-752-10).
21. Repair as required.

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL INTAKE MANIFOLD**

---

**INITIAL SETUP:****Test Equipment**

Load Bank (WP 0179, Table 2, Item 2)  
**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Manifold, air intake (WP 0150, Repair Parts List, Figure 45, Item 1)

Brush, wire, scratch, brass (WP 0180, Expendable and Durable Items List, Item 7)

Compound, sealing (WP 0180, Item 16)

Detergent, general purpose (WP 0180, Item 18)

**Personnel Required**

91D (1)

Assistant (1)

**References**

WP 0044, Service Fuel System

WP 0066, Remove/Install 50/60 Hz Engine Assembly

WP 0067, Remove/Install 400 Hz Engine Assembly

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Top body panel removed (WP 0029, Remove/Install Top Body Panel)

Intake air hose and air cross-over tube removed (WP 0019, Remove/Install Air Intake Hose Assemblies)

Intake air heater removed (WP 0082, Remove/Install Air Intake Heater)

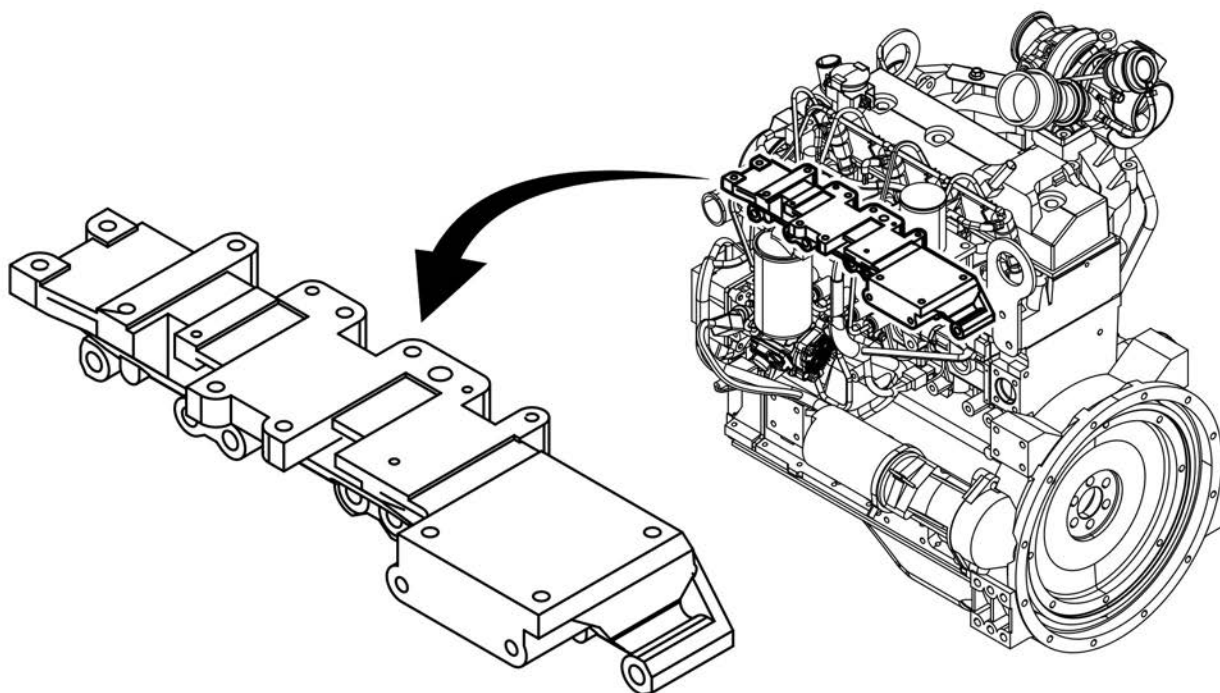
Fuel injection supply lines removed (WP 0074, Test/Replace Fuel Injectors)

Fuel injector and intake manifold temperature sensor wires disconnected (WP 0087, Remove/Install Engine ECM Wiring Harness)

Spin-on fuel filter assembly removed (WP 0072, Remove/Install Spin-On Fuel Filter Assembly)

Intake air temperature sensor removed (WP 0088, Remove/Install Engine ECM Sensors)

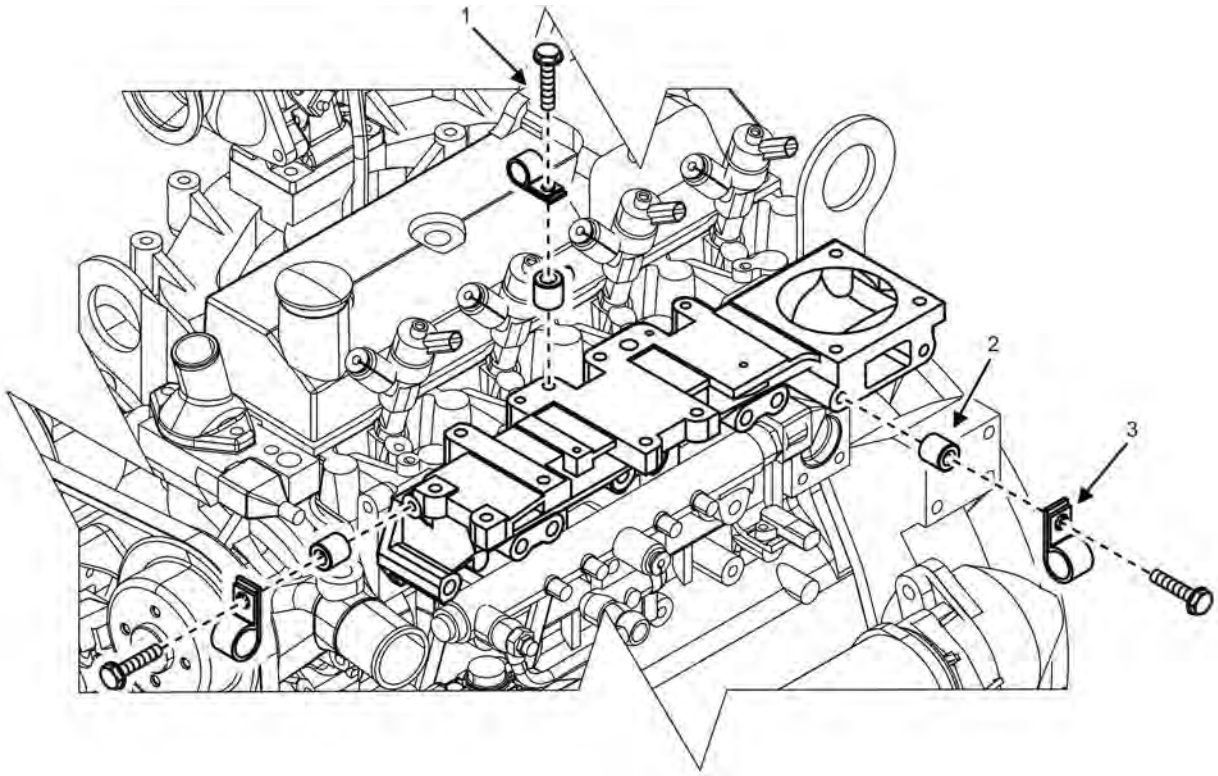
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**REMOVE/INSTALL INTAKE MANIFOLD****Remove Intake Manifold**

**Figure 1. Intake Manifold — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side door and locate intake manifold (Figure 1).



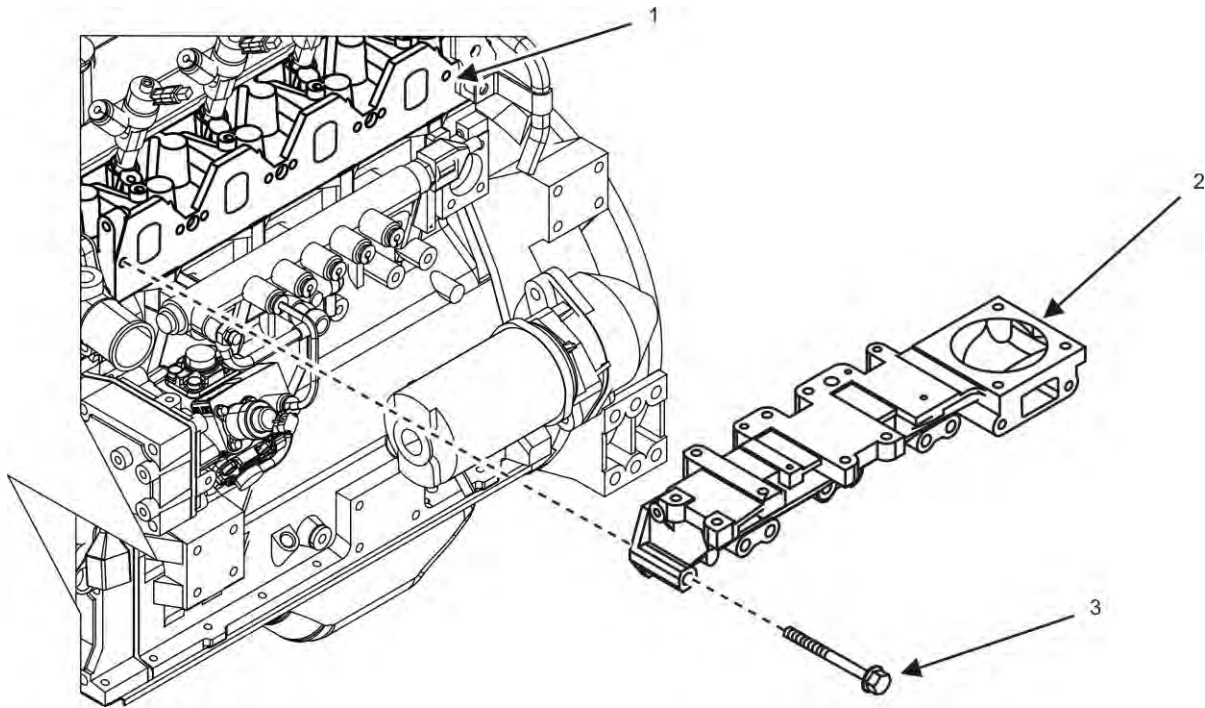


**Figure 2. Wiring Harness Clamps.**

**NOTE**

There are three P-clamps (Figure 2, Item 3) installed to intake manifold. All three P-clamps are removed using the same procedure.

3. Remove screw (Figure 2, Item 1), P-clamp (Figure 2, Item 3), and spacer (Figure 2, Item 2) that secure ECM wiring harness to intake manifold in three locations on cylinder head.
4. Inspect P-clamps (Figure 2, Item 3) for damage or corrosion. Replace damaged or corroded P-clamps (Figure 2, Item 3).
5. Reposition ECM wiring harness (not shown) to gain access to intake manifold mounting screws (Figure 3, Item 3).



**Figure 3. Intake Manifold — Removal.**

6. Remove eight mounting screws (Figure 3, Item 3) securing intake manifold (Figure 3, Item 2) to cylinder head (Figure 3, Item 1).
7. Remove intake manifold (Figure 3, Item 2) from cylinder head (Figure 3, Item 1).
8. Place intake manifold (Figure 3, Item 2) on a suitable work surface.
9. Cover intake ports in cylinder head (Figure 3, Item 1) to keep dirt and debris from entering.
10. Remove any residual gasket material from mounting surfaces of cylinder head (Figure 3, Item 1) and intake manifold (Figure 3, Item 2).

### WARNING

Water solution hot enough to clean engine parts is hot enough to cause scald injury to personnel. Be sure to wear protective clothing, gloves, and goggles while cleaning pistons. Failure to comply may cause injury or death to personnel.

11. Clean intake manifold (Figure 3, Item 2) in a strong solution of hot water and detergent using a stiff bristle brush.

**END OF TASK**

---

**Inspect Intake Manifold**

1. Inspect intake manifold (Figure 3, Item 2) for cracks and other obvious damage.
2. Replace intake manifold (Figure 3, Item 2) if cracked or damaged.
3. Inspect intake manifold mounting surface on cylinder head (Figure 3, Item 1) for cracks or other obvious signs of damage.
4. Replace engine assembly (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly) if cracks or damage are found on intake manifold mounting surface of cylinder head (Figure 3, Item 1).

**END OF TASK****Install Intake Manifold**

1. Remove cover from intake ports in cylinder head (Figure 3, Item 1).
2. Apply a 0.039 in (1 mm) bead of gasket sealant to mounting surfaces of cylinder head (Figure 3, Item 1) and intake manifold (Figure 3, Item 2).
3. Position intake manifold (Figure 3, Item 2) to its mounting position on cylinder head (Figure 3, Item 1) and align mounting holes.
4. Secure intake manifold (Figure 3, Item 2) to cylinder head (Figure 3, Item 1) by installing eight mounting screws (Figure 3, Item 2) finger-tight.
5. Tighten intake manifold mounting screws (Figure 3, Item 3) to 48 ft/lb (65 Nm) using a crossing pattern to apply even pressure to gasket.
6. Position ECM wiring harness (not shown) to its approximate mounting location on cylinder head (Figure 3, Item 1).

**NOTE**

There are three P-clamps installed to intake manifold. All three P-clamps are installed using the same procedure.

7. Position spacer (Figure 2, Item 2) and P-clamp (Figure 2, Item 3) to mounting location on cylinder head (Figure 3, Item 1).
8. Install ECM wiring harness to P-clamp (Figure 2, Item 3).
9. Secure P-clamp (Figure 2, Item 3) to cylinder head by installing screw (Figure 2, Item 1).
10. Repeat step 7 through 9 to install two remaining P-clamps (Figure 2, Item 3) and secure ECM wiring harness.
11. Install spin-on fuel filter assembly (WP 0072, Remove/Install Spin-on Fuel Filter Assembly).
12. Connect ECM wiring harness to intake manifold pressure sensor and to four fuel injectors (WP 0087, Remove/Install Engine ECM Wiring Harness).
13. Install fuel injection supply lines (WP 0074, Test/Replace Fuel Injectors).
14. Install air intake heater (WP 0082, Remove/Install Air Intake Heater).
15. Install air cross-over tube and air intake hose (WP 0019, Remove/Install Air Intake Hose Assemblies).
16. Install top body panel (WP 0029, Remove/Install Top Body Panel).
17. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
18. Purge fuel lines (WP 0044, Service Fuel System).
19. Close left-side door.

- 20. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
- 21. Start engine and check for proper operation (TM 9-6115-752-10).
- 22. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL MUFFLER**

---

**INITIAL SETUP:****Test Equipment**

Load Bank (WP 0179, Table 2, Item 2)  
**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Muffler 30 kW (WP 0114, Repair Parts List, Figure 9, Item 2)

Compound, antiseize (WP 0180, Expendable and Durable Items List, Item 14)

Grease, electrically conductive (WP 0180, Item 22)

Penetrating oil (WP 0180, Item 31)

**Personnel Required**

91D (1)

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Right-side exhaust heat shield removed (WP 0030, Remove/Install Front Body Panel)

**REMOVE/INSTALL MUFFLER****Remove Muffler****WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate muffler (Figure 1) on right-side of generator set.

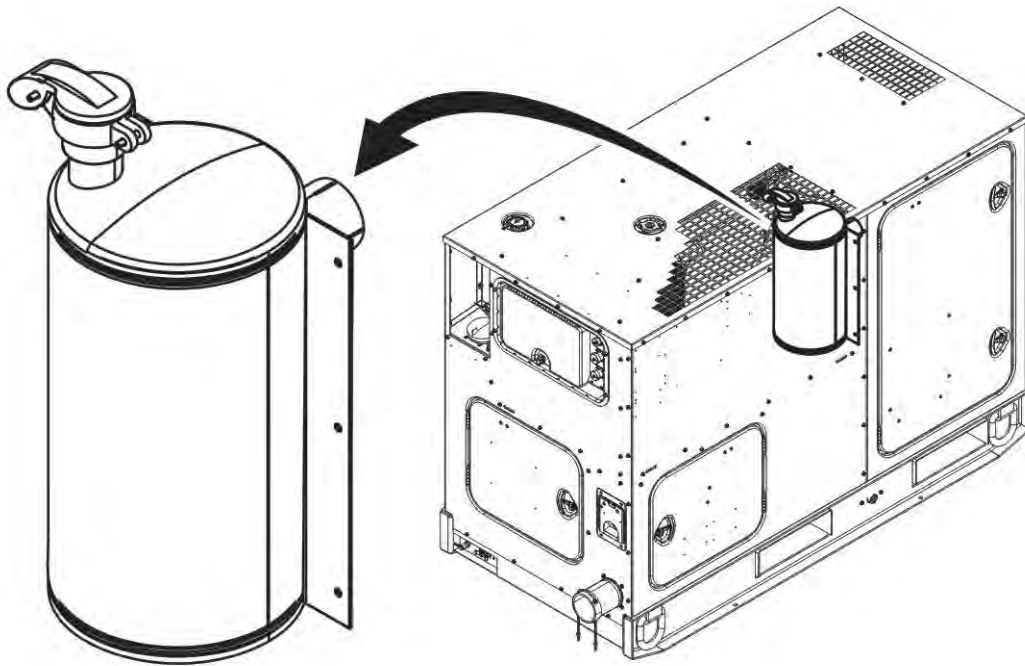


Figure 1. Muffler — Location.

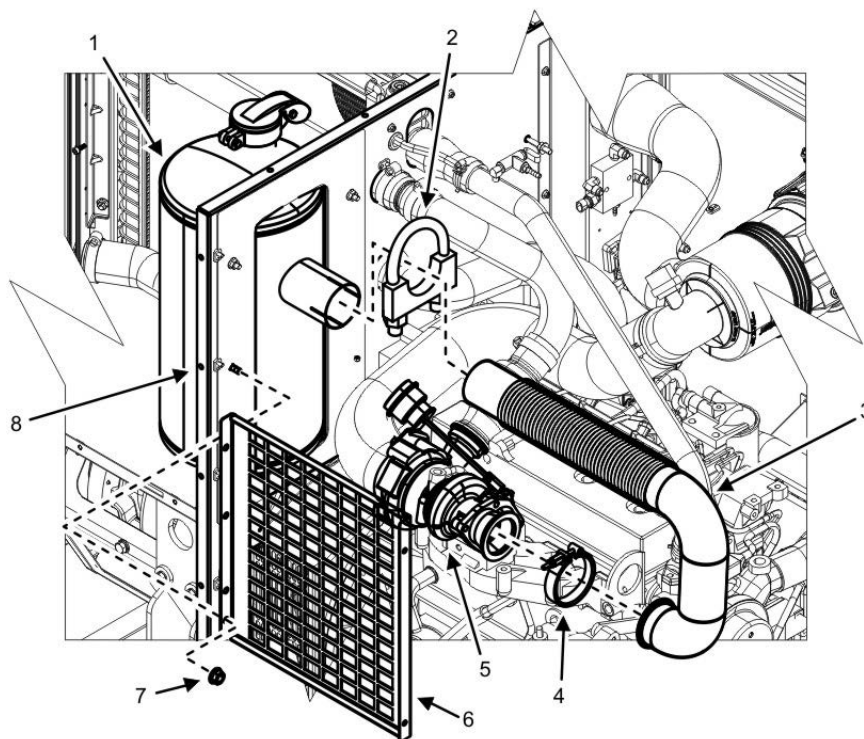
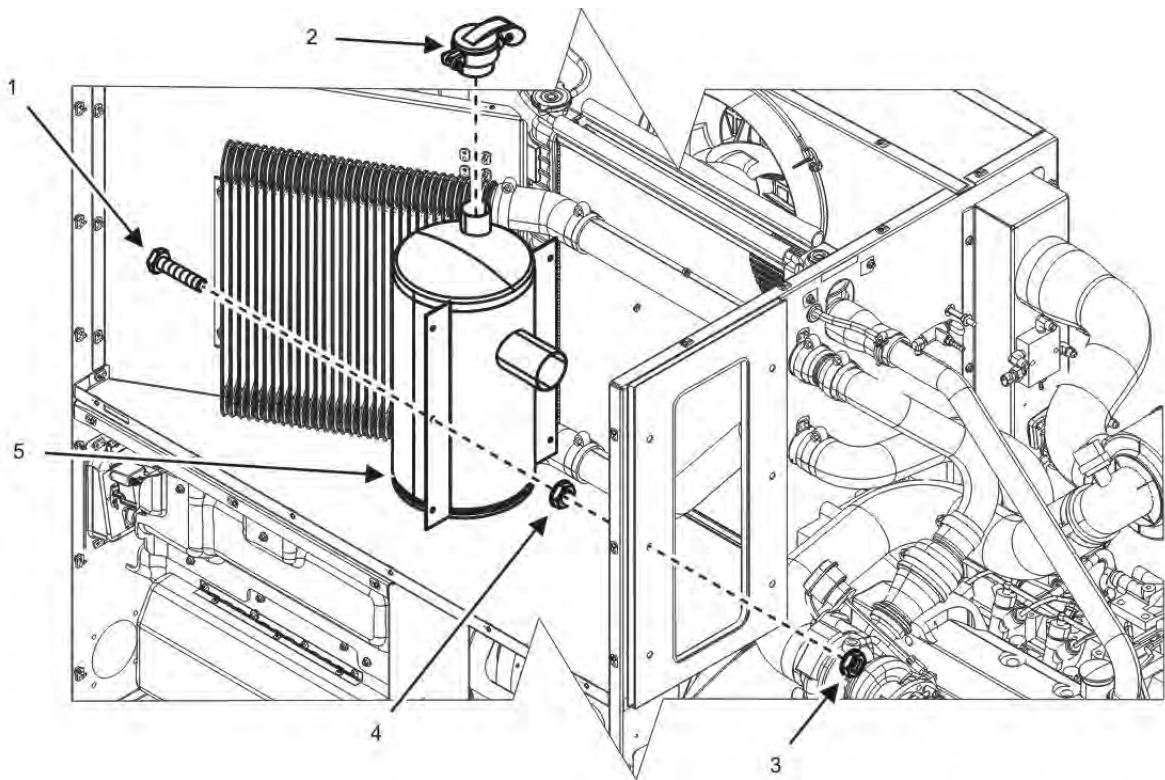


Figure 2. Flex Pipe — Removal.

**NOTE**

Excessive heat from engine exhaust makes exhaust system parts difficult to separate. Apply a liberal amount of penetrating oil to mounting hardware of clamps that secure flex pipe to muffler and turbocharger, and also to joint between muffler and flex pipe. Allow penetrating oil to soak for 5 min.

3. Remove two nuts (Figure 2, Item 7) that secure the left side exhaust heat shield (Figure 2, Item 6) to interior body panel (Figure 2, Item 8).
4. Remove exhaust heat shield (Figure 2, Item 6) from generator set to gain access to exhaust system components.
5. Loosen screw on V-band clamp (Figure 2, Item 4) that secures flex pipe (Figure 2, Item 3) to turbocharger (Figure 2, Item 5).
6. Separate flex pipe (Figure 2, Item 3) from turbocharger (Figure 2, Item 5) and remove V-band clamp (Figure 2, Item 4).



**Figure 3. Muffler — Removal.**

7. Remove the four remaining nuts (Figure 3, Item 3) securing muffler (Figure 3, Item 5) to unit.
8. Loosen two nuts on U-clamp (Figure 2, Item 2) that secures flex pipe (Figure 2, Item 3) to muffler (Figure 2, Item 1).
9. Remove flex pipe (Figure 2, Item 3) from generator set.
10. Remove the muffler (Figure 3, Item 5) from the generator set by pulling the muffler (Figure 3, Item 5) away from the rear of interior panel.
11. Remove six bolts (Figure 3, Item 1) and six nuts (Figure 3, Item 4) from muffler (Figure 3, Item 5).

12. Unscrew and remove rain cap (Figure 3, Item 2) from muffler (Figure 3, Item 5).

## END OF TASK

### Inspect Muffler

1. Inspect muffler (Figure 3, Item 5) and flex pipe (Figure 2, Item 3) for signs of obvious damage. Replace damaged components.
2. Inspect U-clamp (Figure 2, Item 2) and V-band clamp (Figure 2, Item 4) for signs of obvious damage and corrosion that will limit the effectiveness of the clamps. Replace damaged/excessively corroded components.
3. Inspect rain cap (Figure 3, Item 2) for signs of obvious damage. Replace damaged rain cap (Figure 3, Item 2).

## END OF TASK

### Install Muffler

1. Install rain cap (Figure 3, Item 2) to muffler (Figure 3, Item 5).
2. Install muffler (Figure 3, Item 5) to generator set by inserting six bolts (Figure 3, Item 1) into mounting holes on the rear of interior panel. Secure muffler (Figure 3, Item 5) by installing four nuts (Figure 3, Item 3) leaving the outboard center and lower muffler mounting bolts (Figure 3, Item 1) free of nuts (Figure 3, Item 3).
3. Install U-clamp (Figure 2, Item 2) onto inlet of muffler (Figure 2, Item 1).
4. Apply antiseize compound to joint between flex pipe (Figure 2, Item 3) and muffler (Figure 2, Item 1) and to threads on U-clamp (Figure 2, Item 2).
5. Install flex pipe (Figure 2, Item 3) into inlet of muffler (Figure 2, Item 1) and secure by positioning U-clamp (Figure 2, Item 2) and tightening two nuts finger-tight.
6. Install V-band clamp (Figure 2, Item 4) over opposite end of flex pipe (Figure 2, Item 3) and position flex pipe (Figure 2, Item 3) to turbocharger (Figure 2, Item 5).
7. Secure flex pipe (Figure 2, Item 3) to turbocharger (Figure 2, Item 5) by positioning V-band clamp (Figure 2, Item 4) and tightening screw finger-tight.
8. Check alignment of flex pipe (Figure 2, Item 3) to ensure it does not touch other components and tighten nuts on U-clamp (Figure 2, Item 2) and screw on V-band clamp (Figure 2, Item 4).
9. Position left-side exhaust heat shield (Figure 2, Item 6) to its mounting location on interior body panel (Figure 2, Item 8) and secure by installing two nuts (Figure 2, Item 7) to outboard center and lower muffler mounting bolts (Figure 3, Item 1).
10. Install right-side exhaust heat shield (WP 0030, Remove/Install Front Body Panel).
11. Install top body panel (WP 0029, Remove/Install Top Body Panel).
12. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
13. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
14. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
15. Repair as required.

## END OF TASK

## END OF WORK PACKAGE



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL TURBOCHARGER**

---

**INITIAL SETUP:****Test Equipment**

Load Bank (WP 0179, Table 2, Item 2)  
**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Gasket, oil drain line (1) (WP 0141, Repair Parts List, Figure 35, Item 8)

Gasket, turbocharger to exhaust manifold (1) (WP 0141, Figure 36, Item 3)

Seal, O-Ring (1) (WP 0141, Figure 36, Item 28)

Turbocharger (1) (WP 0141, Figure 36, Item 1)

Cap set, protective (WP 0180, Expendable and Durable Items List, Item 8)

Cleaning compound, solvent (WP 0180, Item 11)

Cotton swab, special (WP 0180, Item 17)

Rag, wiping (WP 0180, Item 33)

**Personnel Required**

91D (1)

**References**

WP 0084, Remove/Install Muffler

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Top body panel removed (WP 0029, Remove/Install Top Body Panel)

Right-side exhaust heat shield removed (WP 0030, Remove/Install Front Body Panel)

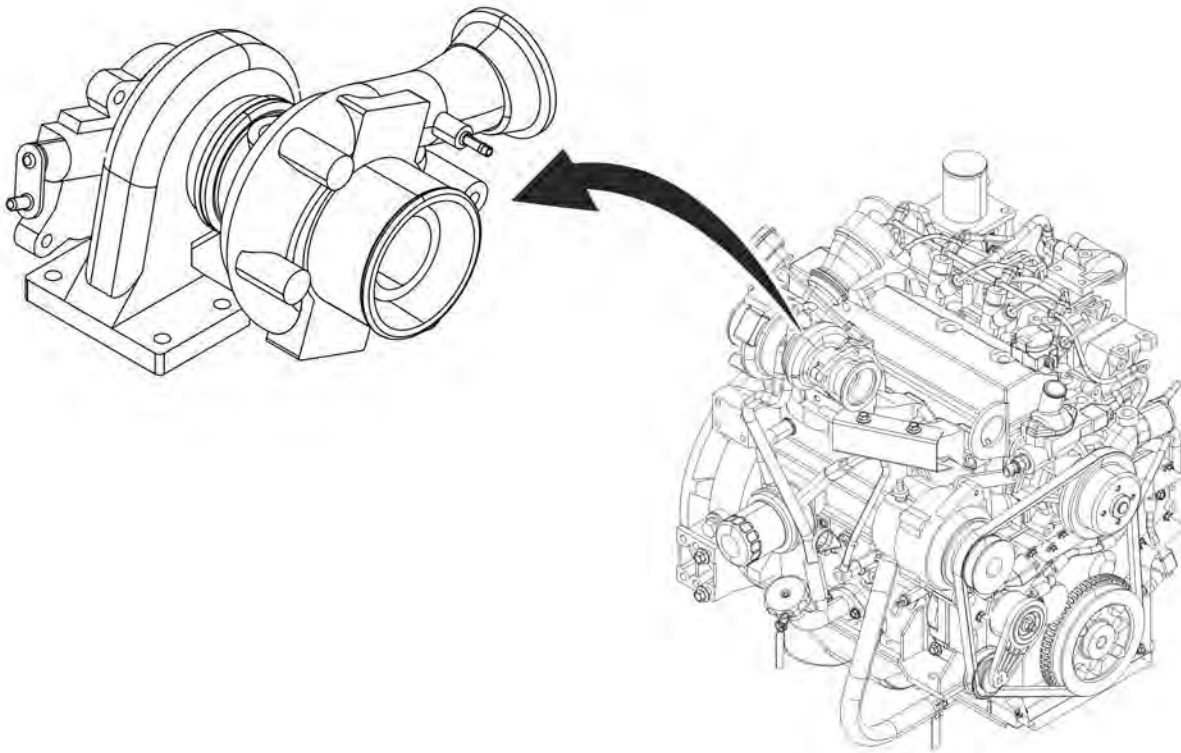
Left-side exhaust heat shield removed WP 0084, Remove/Install Muffler)

Turbocharger air intake hose removed (WP 0019, Remove/Install Air Intake Hose Assemblies)

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**REMOVE/INSTALL TURBOCHARGER**

## Remove Turbocharger



**Figure 1. Turbocharger — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door and locate turbocharger (Figure 1).
3. Remove V-band clamp (Figure 2, Item 9) that secures exhaust elbow (Figure 2, Item 10) to turbocharger.
4. Loosen two nuts that secure U-clamp (not shown) of muffler to flex pipe (WP 0084, Remove/Install Muffler).
5. Remove exhaust elbow (Figure 2, Item 10) from turbocharger (Figure 2, Item 1).
6. Remove V-band clamp (Figure 2, Item 6) that secures charge air cooler supply hose (Figure 2, Item 5) to turbocharger (Figure 2, Item 1).
7. Reposition charge air cooler supply hose (Figure 2, Item 5) clear of turbocharger (Figure 2, Item 1).
8. Remove and discard O-ring (Figure 2, Item 7) from charge air cooler supply hose (Figure 2, Item 5).

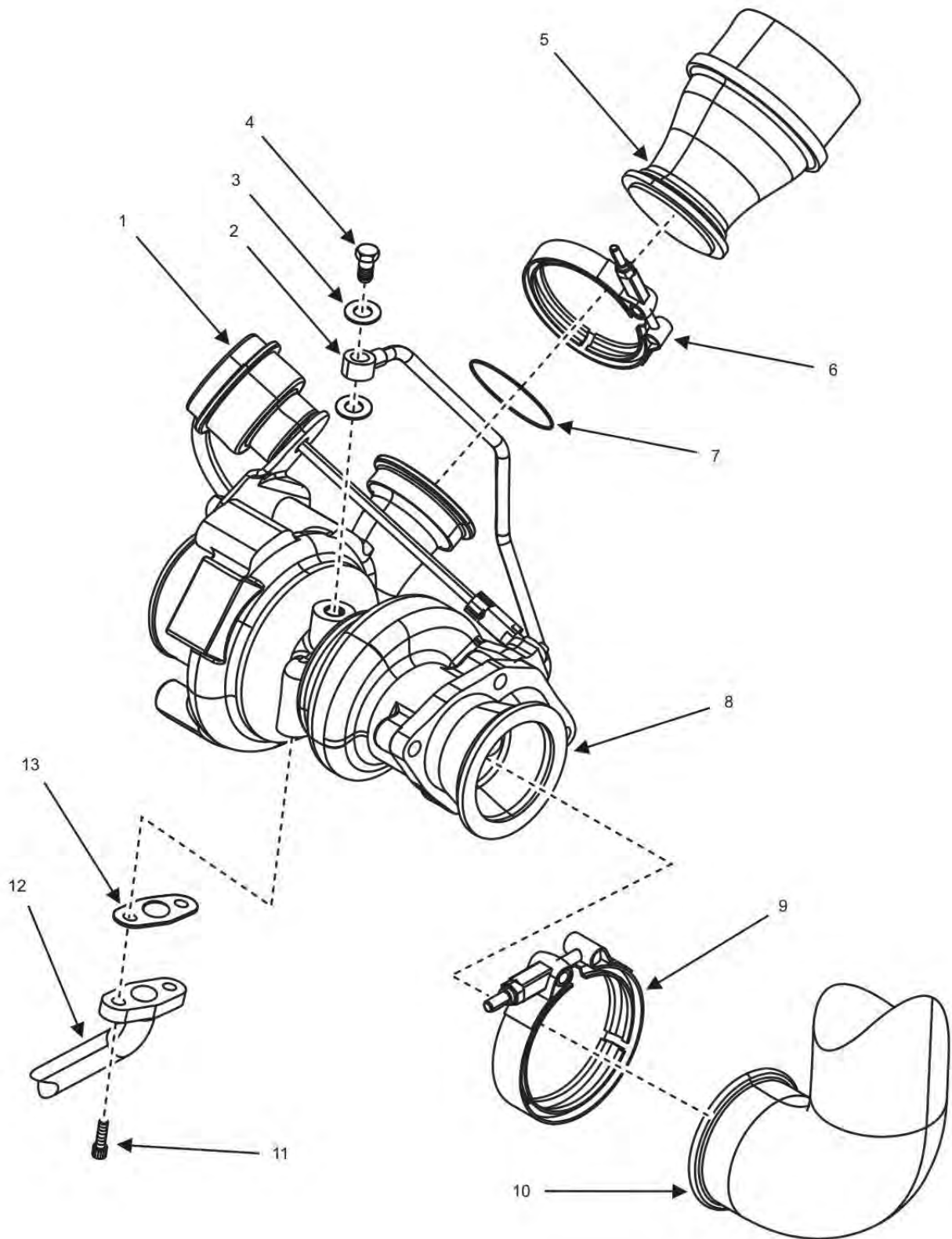
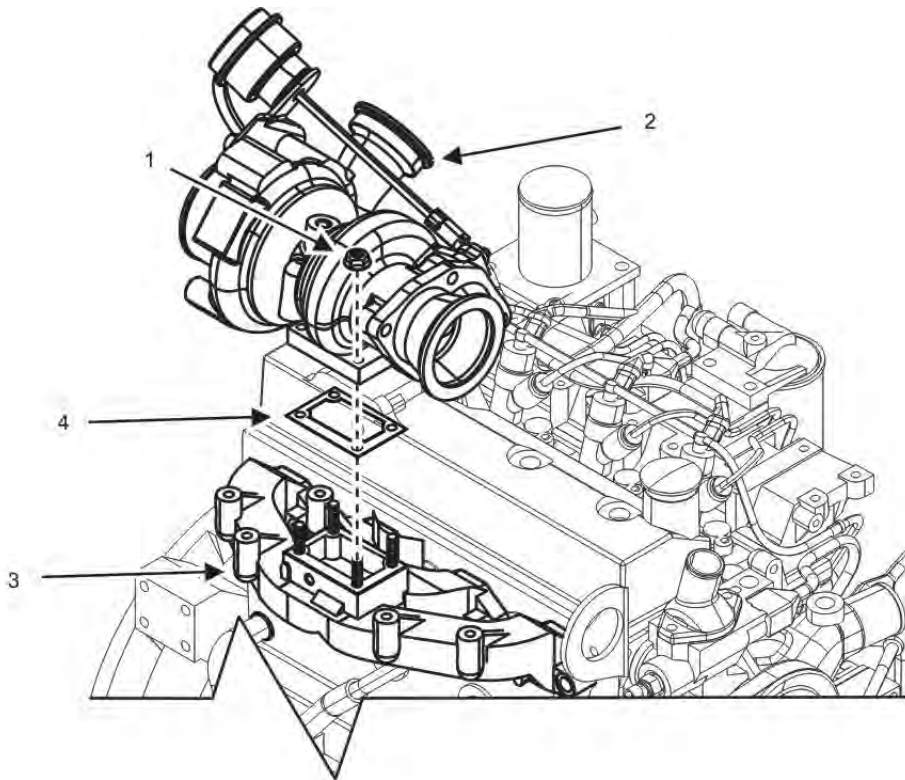


Figure 2. Turbocharger — Oil Lines.

9. Place a wiping rag under the turbocharger oil supply line (Figure 2, Item 2) to capture spilled oil when line is removed.
10. Remove banjo bolt (Figure 2, Item 4) and two sealing washers (Figure 2, Item 3) that secure oil supply line (Figure 2, Item 2) to turbocharger (Figure 2, Item 1). Discard sealing washers (Figure 2, Item 3).
11. Reposition oil supply line (Figure 2, Item 2) away from turbocharger.
12. Cap/plug open oil supply line (Figure 2, Item 2) and oil supply port in turbocharger (Figure 2, Item 1) to prevent dirt and debris from entering the turbocharger (Figure 2, Item 1).
13. Place a wiping rag under the turbocharger oil drain line (Figure 2, Item 12) to capture spilled oil when line is removed.
14. Remove two screws (Figure 2, Item 11) and gasket (Figure 2, Item 13) that secure oil drain line (Figure 2, Item 12) to turbocharger (Figure 2, Item 1). Discard gasket (Figure 2, Item 13).
15. Disconnect oil drain line (Figure 2, Item 12) from turbocharger (Figure 2, Item 1).
16. Cap/plug open oil drain line (Figure 2, Item 12) and oil drain port in turbocharger (Figure 2, Item 1) to prevent dirt and debris from entering the turbocharger (Figure 2, Item 1).



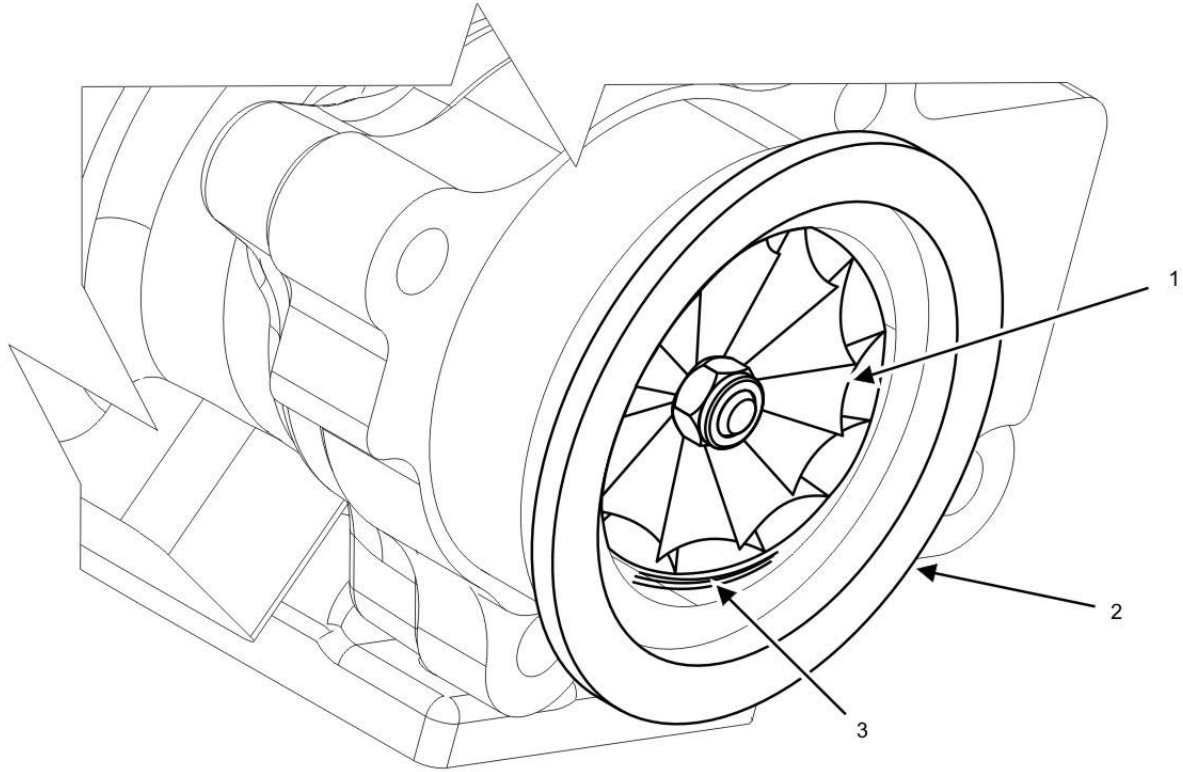
**Figure 3. Turbocharger — Removal.**

17. Remove the four mounting nuts (Figure 3, Item 1) from the mounting studs.
18. Remove turbocharger (Figure 3, Item 2) and gasket (Figure 3, Item 4) from exhaust manifold (Figure 3, Item 3). Discard gasket (Figure 3, Item 4).
19. Remove any residual gasket material from the mounting surfaces of turbocharger (Figure 3, Item 2) and exhaust manifold (Figure 3, Item 3).

**END OF TASK**

**Inspect Turbocharger**

1. Inspect turbocharger (Figure 3, Item 2) for evidence of oil leaking past inner seals.
2. Replace turbocharger (Figure 3, Item 2) if leaking oil internally.



**Figure 4. Check Compressor/Turbine Blades.**

**WARNING**

Cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

**NOTE**

To inspect for the blades rubbing against the housing, clean the area between the housing and the blades with cotton swab treated with solvent to remove dirt and carbon. Look carefully for scratches on the housing surface swept by the compressor blades.

3. Clean the area between the housings (Figure 4, Item 3) and the blades (Figure 4, Item 1) using a cotton swab treated with cleaning solvent.
4. Inspect housings of turbocharger turbine and compressor units (Figure 4, Item 2) for evidence of blades (Figure 4, Item 1) contacting the housings (Figure 4, Item 3).
5. Replace turbocharger (Figure 3, Item 2) if either turbine or compressor blades (Figure 4, Item 1) have been rubbing the housings (Figure 4, Item 3).

**END OF TASK**

---

**Install Turbocharger**

1. Position new gasket (Figure 3, Item 4) to its mounting location on exhaust manifold (Figure 3, Item 3).
2. Install turbocharger (Figure 3, Item 2) over mounting studs of exhaust manifold (Figure 3, Item 3) and on top of new gasket (Figure 3, Item 4).
3. Secure turbocharger (Figure 3, Item 2) to exhaust manifold (Figure 3, Item 3) by installing four mounting nuts (Figure 3, Item 1) onto mounting studs.
4. Remove caps/plugs from oil drain line (Figure 2, Item 12) and oil drain port of turbocharger (Figure 2, Item 1).
5. Position oil drain line (Figure 2, Item 12) and new gasket (Figure 2, Item 13) to oil drain port of turbocharger (Figure 2, Item 1) and align the mounting holes.
6. Secure oil drain line (Figure 2, Item 12) to turbocharger (Figure 2, Item 1) by installing two screws (Figure 2, Item 11).
7. Tighten oil drain line mounting screws (Figure 2, Item 11) to 18 ft/lb (24 Nm).
8. Remove caps/plugs from oil supply line (Figure 2, Item 2) and oil supply port of turbocharger (Figure 2, Item 1).
9. Position oil supply line (Figure 2, Item 2) and two new sealing washers (Figure 2, Item 3) to oil supply port of turbocharger (Figure 2, Item 1), and align the mounting holes.
10. Secure oil supply line (Figure 2, Item 2) to turbocharger (Figure 2, Item 1) by installing banjo bolt (Figure 2, Item 4).
11. Tighten oil supply line banjo bolt (Figure 2, Item 4) to 18 ft/lb (24 Nm).
12. Install new O-ring (Figure 2, Item 7) to charge air cooler supply hose (Figure 2, Item 5).
13. Position charge air cooler supply hose (Figure 2, Item 5) to turbocharger (Figure 2, Item 1).
14. Install V-band clamp (Figure 2, Item 6) that secures charge air cooler supply hose (Figure 2, Item 5) to turbocharger (Figure 2, Item 1).
15. Install exhaust elbow (Figure 2, Item 10) to exhaust port (Figure 2, Item 8) of turbocharger (Figure 2, Item 1) and secure by installing V-band clamp (Figure 2, Item 9).
16. Install air intake hose to intake port of turbocharger (WP 0019, Remove/Install Air Intake Hose Assemblies).
17. Install left-side exhaust heat shield (WP 0084, Remove/Install Muffler).
18. Install right-side exhaust heat shield (WP 0030, Remove/Install Front Body Panel).
19. Install top body panel (WP 0029, Remove/Install Top Body Panel).
20. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
21. Close right-side door.
22. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
23. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
24. Repair as required.
25. Dispose of captured oil and soiled rags IAW local SOP.

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL EXHAUST MANIFOLD**

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**INITIAL SETUP:****Test Equipment**

Load Bank (WP 0179, Table 2, Item 2)  
**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Gasket, exhaust manifold (1) (WP 0151, Repair Parts List, Figure 46, Item 2)

Gasket, oil drain (WP 0141, Repair Parts List, Figure 36, Item 8)

Gasket, turbocharger to exhaust manifold (1) (WP 0141, Figure 36, Item 3)

Manifold, exhaust (WP 0151, Figure 46, Item 1)

Screw, hex flange head cap (8) (WP 0151, Figure 46, Item 3)

Compound, antiseize (WP 0180, Expendable and Durable Items List, Item 14)

Grease, electrically conductive (WP 0180, Item 22)

Rag, wiping (WP 0180, Item 33)

**Personnel Required**

91D (1)

**Equipment Conditions**

Engine control switch turned OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Front body panel removed (WP 0030, Remove/Install Front Body Panel)

Right-hand exhaust guard removed (WP 0030, Remove/Install Front Body Panel and WP 0084, Remove/Install Muffler)

Muffler inlet pipe removed (WP 0084, Remove/Install Muffler)

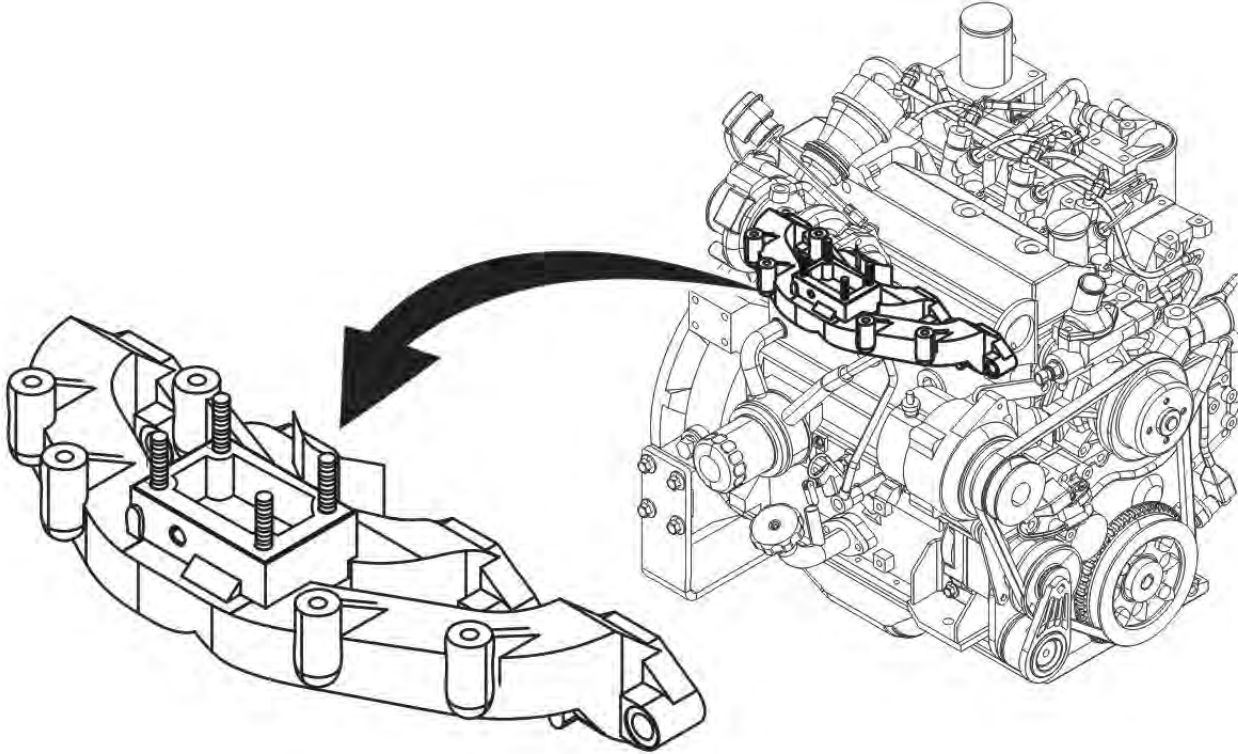
Turbocharger removed (WP 0085, Remove/Install Turbocharger)

Battery-charging alternator belt removed (WP 0080, Remove/Install Battery-Charging Alternator Belt)

Battery-charging alternator removed (WP 0079, Remove/Install Battery-Charging Alternator)

## REMOVE/INSTALL EXHAUST MANIFOLD

### Remove Exhaust Manifold



**Figure 1. Exhaust Manifold — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door and locate exhaust manifold (Figure 1).
3. Remove eight cap screws (Figure 2, Item 4) securing exhaust manifold (Figure 2, Item 3) to cylinder head (Figure 2, Item 1).
4. Remove exhaust manifold (Figure 2, Item 3) and place on a suitable work surface.

### CAUTION

When scraping gasket material from engine block, keep gasket scrapings and other foreign material from entering the engine block. Do not use a screw driver to scrape gasket material. Failure to comply may cause damage to equipment.

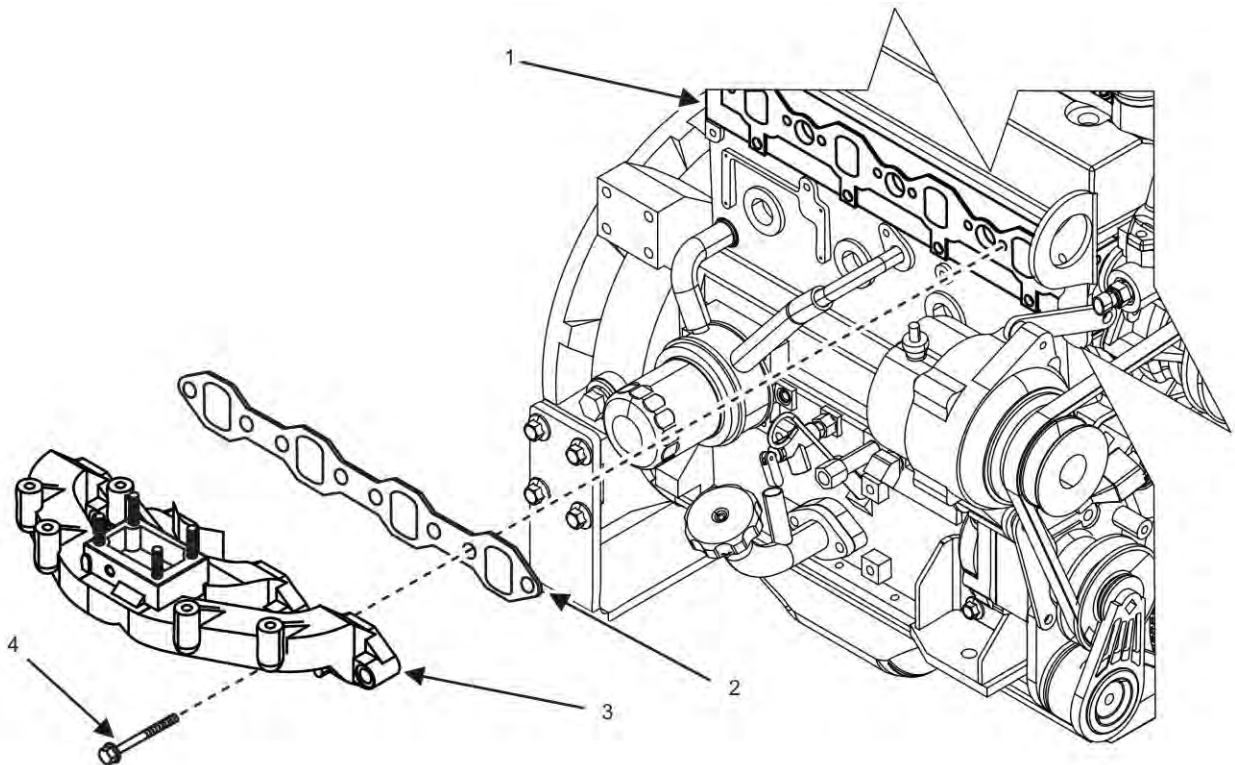
5. Remove exhaust manifold gasket (Figure 2, Item 2).
6. Discard cap screws (Figure 2, Item 4) and gasket (Figure 2, Item 2).



**CAUTION**

Cover and protect exhaust openings in cylinder head to prevent dirt and debris from entering engine. Failure to comply may cause damage to equipment.

7. Confirm exhaust manifold (Figure 2, Item 3) and cylinder head (Figure 2, Item 1) mounting surfaces are free of dirt, debris, or residual gasket material.

**END OF TASK****Inspect Exhaust Manifold**

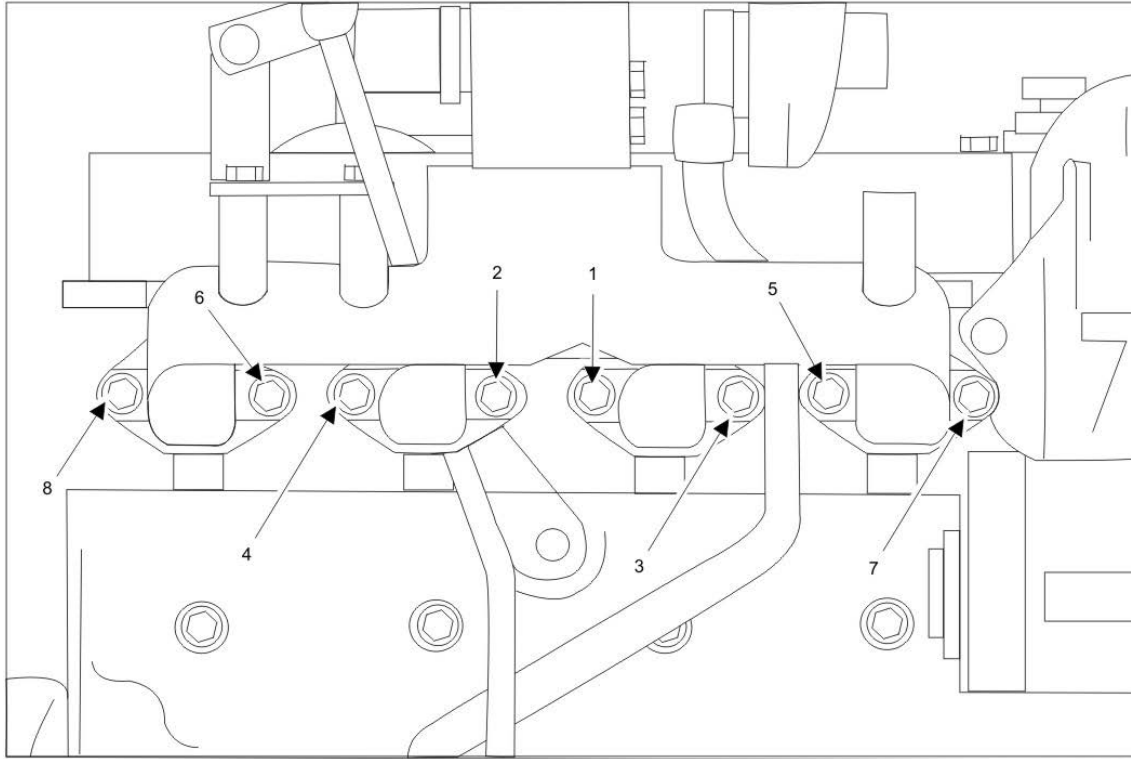
**Figure 2. Exhaust Manifold — Removal.**

1. Inspect exhaust manifold (Figure 2, Item 3) for damage and cracks.
2. Replace exhaust manifold (Figure 2, Item 3) if damaged or cracked.

**END OF TASK****Install Exhaust Manifold**

1. Clean dirt and debris from mounting surfaces of exhaust manifold (Figure 2, item 3) and cylinder head (Figure 2, Item 1) with wiping rag upon installation. Ensure plugs or covers over ports have been removed.
2. Apply coat of antiseize lubricant to eight new exhaust manifold cap screws (Figure 2, Item 4).
3. Position new gasket (Figure 2, Item 2) to its mounting location on cylinder head (Figure 2, Item 1) and align mounting holes.

4. Position exhaust manifold (Figure 2, item 3) to its mounting location on cylinder head (Figure 2, item 1) and align mounting holes.
5. Install eight new cap screws (Figure 2, Item 4) through exhaust manifold (Figure 2, Item 3) and gasket (Figure 2, Item 2) and into cylinder head (Figure 2, Item 1). Finger tighten all cap screws.



**Figure 3. Cap Screws — Torque Sequence.**

6. Tighten cap screws (Figure 2, Item 4) to 33 ft/lb (45 Nm) following the sequence shown in Figure 3.
7. Install battery-charging alternator (WP 0079, Remove/Install Battery-Charging Alternator).
8. Install battery-charging alternator belt (WP 0080, Remove/Install Battery-Charging Alternator Belt).
9. Install turbocharger assembly (WP 0085, Remove/Install Turbocharger).
10. Install muffler inlet pipe, if required (WP 0084, Remove/Install Muffler).
11. Install right-hand exhaust guard (WP 0030, Remove/Install Front Body Panel and WP 0084, Remove/Install Muffler).
12. Install front body panel (WP 0030, Remove/ Install Front Body Panel).
13. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
14. Close right-side door.
15. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
16. Start engine and check for proper operation (TM 9-6115-752-10).
17. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL ENGINE ECM WIRING HARNESS**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Wiring harness (1) (WP 0155, Repair Parts List, Figure 50, Item 1)

Grease, electrically conductive (WP 0180, Expendable and Durable Items List, Item 22)

**Personnel Required**

91D (1)

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Front body panel removed (WP 0030, Remove/Install Front Body Panel)

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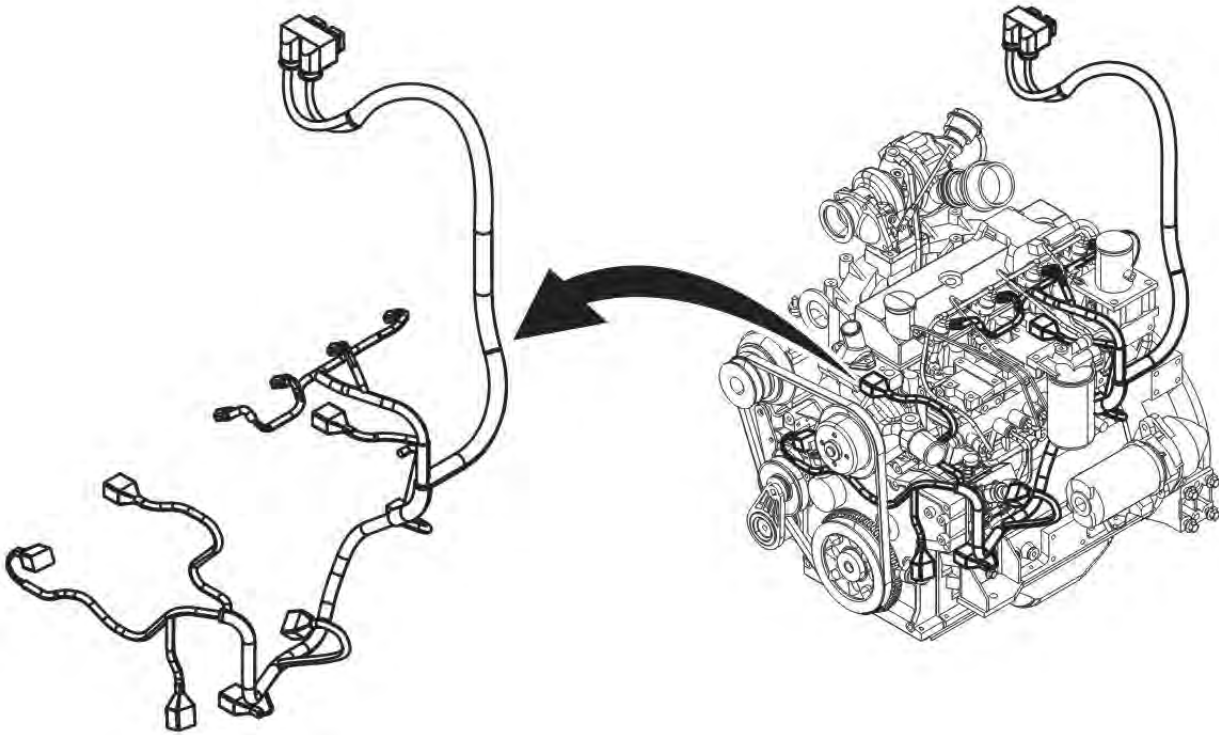
**REMOVE ENGINE ECM WIRING HARNESS****WARNING**

- DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Do not ground yourself in standing water. Failure to comply may cause injury or death to personnel and damage to equipment.
- When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

## Remove ECM Wiring Harness

### NOTE

Electrical connectors of the ECM wiring harness are not unique to each sensor and do require additional marking or tagging prior to removal.

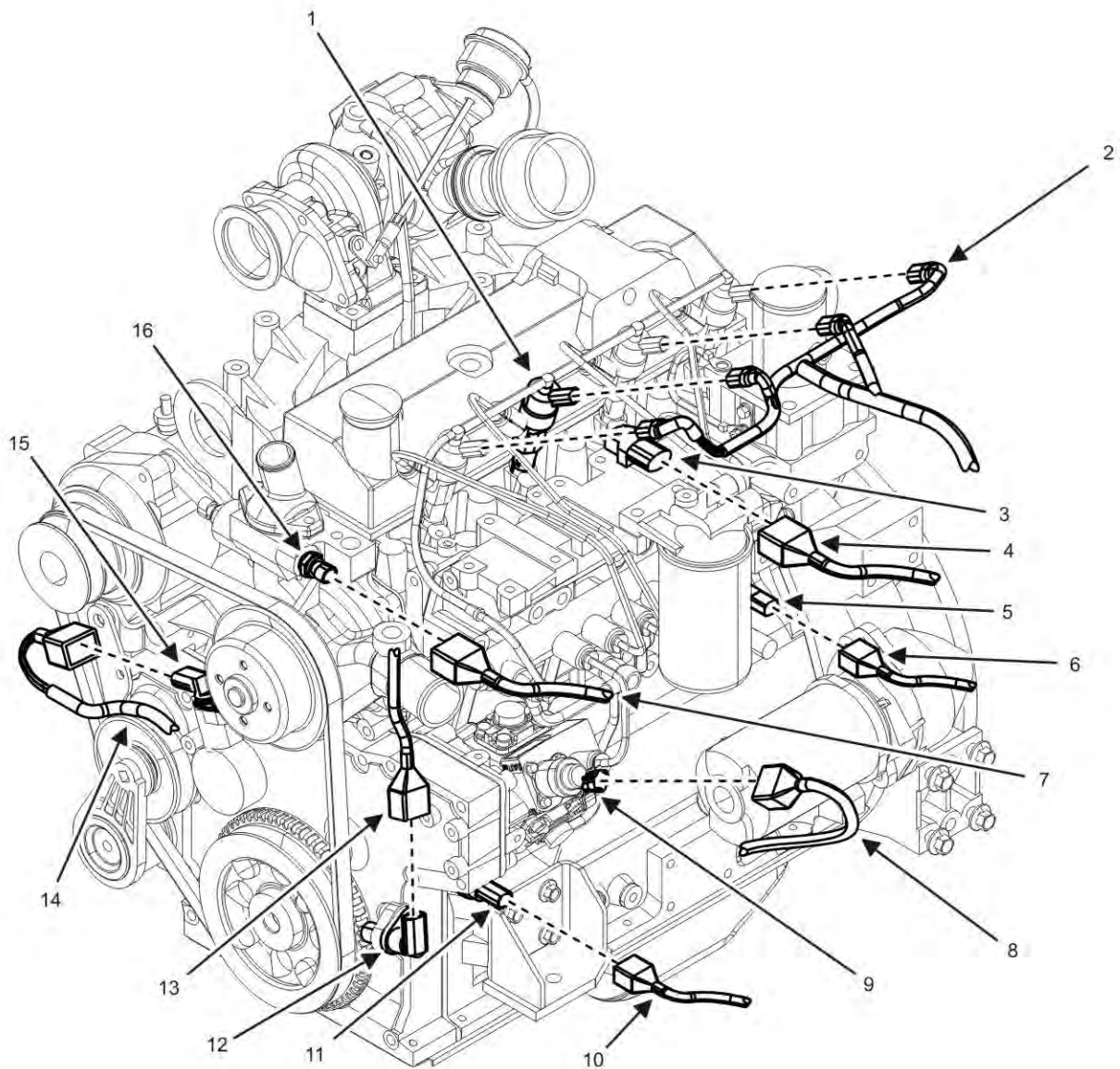


**Figure 1. ECM Wiring Harness — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left- and right-side doors and locate ECM wiring harness (Figure 1).

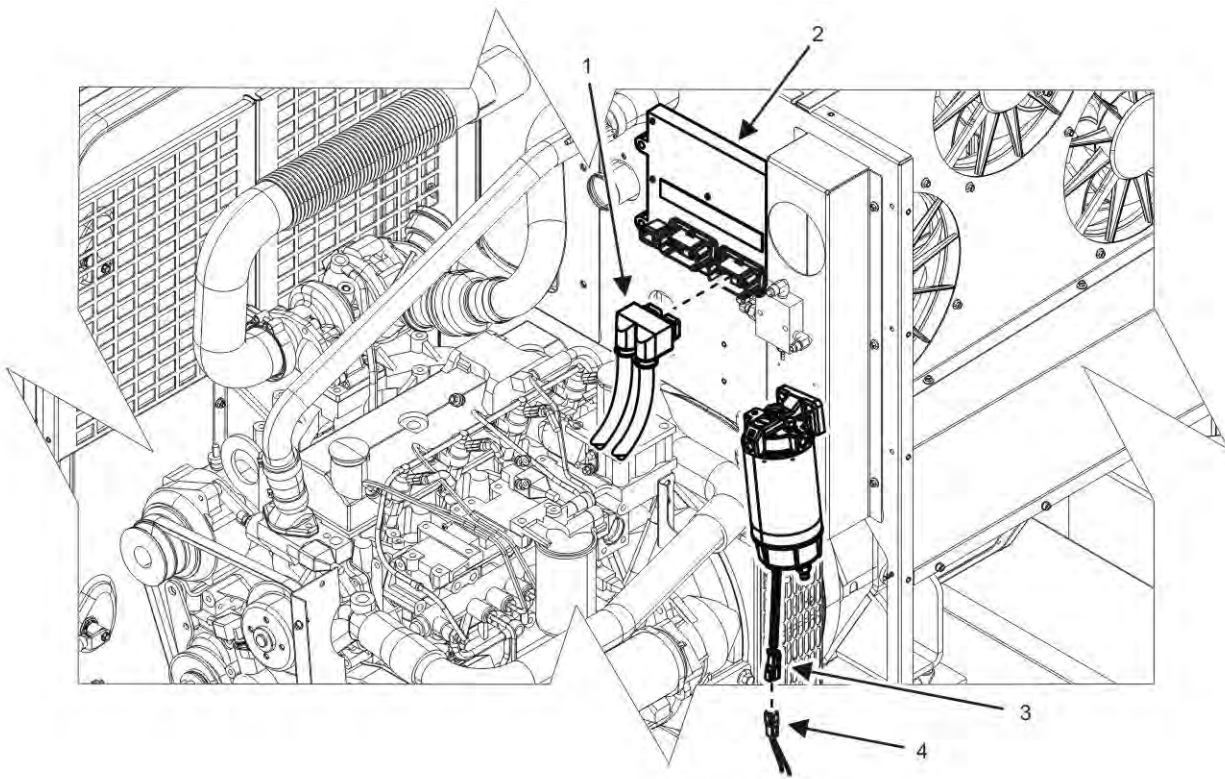
Legend

- |  |                                      |
|--|--------------------------------------|
| 1. Fuel Injector                         | 8. High Pressure Fuel Pump Connector |
| 2. Fuel Injector Connector               | 9. High Pressure Fuel Pump Sensor    |
| 3. Intake Manifold Temperature Sensor    | 10. Oil Pressure Connector           |
| 4. Intake Manifold Temperature Connector | 11. Oil Pressure Sensor              |
| 5. Ambient Air Temperature Sensor        | 12. Engine Speed Sensor              |
| 6. Ambient Air Temperature Connector     | 13. Engine Speed Connector           |
| 7. Coolant Temperature Connector         | 14. Camshaft Position Connector      |
|  | 15. Camshaft Position Sensor         |
|  | 16. Coolant Temperature Sensor       |



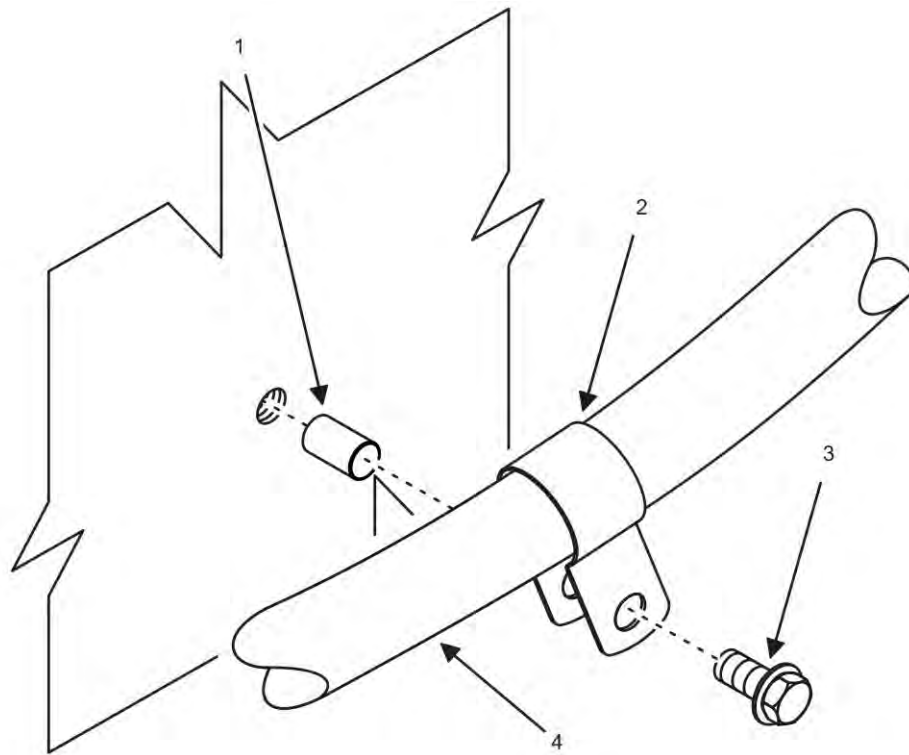
**Figure 2. ECM Wiring Harness — Remove Front of Engine.**

3. Reposition boot, release locking tab, and remove coolant temperature connector (Figure 2, Item 7) from coolant temperature sensor (Figure 2, Item 16).
4. Reposition boot, release locking tab, and remove oil pressure connector (Figure 2, Item 10) from oil pressure sensor (Figure 2, Item 11).
5. Reposition boot, release locking tab, and remove camshaft position connector (Figure 2, Item 14) from camshaft position sensor (Figure 2, Item 15).
6. Reposition boot, release locking tab, and remove engine speed connector (Figure 2, Item 13) from engine speed sensor (Figure 2, Item 12).
7. Reposition boot, push down on locking tab, and remove intake manifold temperature connector (Figure 2, Item 4) from intake manifold temperature sensor (Figure 2, Item 3).
8. Push down on locking tab and remove fuel injection connector (Figure 2, Item 2) from each of four fuel injectors (Figure 2, Item 1) on cylinder head of engine.
9. Reposition boot, push down on locking tab, and remove ambient air temperature connector (Figure 2, Item 6) from ambient air temperature sensor (Figure 2, Item 5).
10. Reposition boot, push down on locking tab, and remove high-pressure fuel pump connector (Figure 2, Item 8) from high-pressure fuel pump sensor (Figure 2, Item 9).



**Figure 3. ECM Wiring Harness — Remove from ECM.**

11. Push down on locking tab and remove wiring harness connector (Figure 3, Item 4) from pigtail (Figure 3, Item 3) of fuel filter/water separator.
12. Loosen captive screw of multipin connector (Figure 3, Item 1).
13. Remove multipin connector (Figure 3, Item 1) from ECM (Figure 3, Item 2).



**Figure 4. ECM Wiring Harness — P-Clamps and Wire Ties.**

#### **NOTE**

In a number of locations on the engine block, the ECM wiring harness is secured by P-clamps of varying sizes. All P-clamps are secured to the engine by a single mounting screw. Several of the P-clamps require spacers and/or vibration isolators for installation.

When removing ECM wiring harness note the size and location of P-clamps, spacers, and vibration isolators to aid at installation. Step 14 describes the removal of a typical P-clamp from the engine.

14. Remove mounting screw (Figure 4, Item 3) that secures P-clamp (Figure 4, Item 2) to engine. Remove ECM wiring harness (Figure 4, Item 4) with P-clamp (Figure 4, Item 2) attached and spacer (Figure 4, Item 1), if installed, from engine.

#### **NOTE**

ECM wiring harness may be attached at some points to engine and to other wiring harnesses with wire ties. Cut and discard wire ties. Tag locations to assist in installation.

15. Cut and discard wire ties (not shown) that may secure ECM wiring harness (Figure 1) to other components of the generator set.
16. Remove ECM wiring harness (Figure 1) from generator set and place on a suitable work surface.
17. Remove all P-clamps (Figure 4, Item 2) from ECM wiring harness.

**END OF TASK**

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**Inspect ECM Wiring Harness**

1. Inspect ECM wiring harness (Figure 1) for signs of obvious damage. Replace damaged ECM wiring harness (Figure 1).
2. Inspect each connector on ECM wiring harness (Figure 1) for signs of obvious damage. Replace ECM wiring harness (Figure 1) if damaged connectors are found.
3. Inspect all P-clamps (Figure 4, Item 2) for signs of obvious damage. Replace damaged P-clamps (Figure 4, Item 2).

**END OF TASK****Install ECM Wiring Harness****CAUTION**

Apply electrically conductive grease to all electrical connectors prior to installation. Failure to comply may cause damage to equipment.

**NOTE**

All electrical connectors of the ECM wiring harness require additional marking or tagging for removal and installation. Once the ECM wiring harness is laid into position, the electrical connectors will be in close proximity to their corresponding sensors.

1. Position ECM wiring harness (Figure 1) to its approximate mounting location on intake-side of engine block.
2. Install multipin connector (Figure 3, Item 1) of ECM wiring harness to ECM (Figure 3, Item 2) and secure by tightening captive screw.
3. Install wiring harness connector (Figure 3, Item 4) to pigtail (Figure 3, Item 3) of fuel filter/water separator.
4. Install wiring harness high-pressure fuel pump connector (Figure 2, Item 8) to high-pressure fuel pump sensor (Figure 2, Item 9) and reposition boot.
5. Install wiring harness ambient air temperature connector (Figure 2, Item 6) to ambient air temperature sensor (Figure 2, Item 5) and reposition boot.
6. Install wiring harness fuel injection connector (Figure 2, Item 2) to each of four fuel injectors (Figure 2, Item 1).
7. Install wiring harness intake manifold temperature connector (Figure 2, Item 4) to intake manifold temperature sensor (Figure 2, Item 3) and reposition boot.
8. Install wiring harness engine speed connector (Figure 2, Item 13) to engine speed sensor (Figure 2, Item 12). Engage the locking tab of the connector and reposition boot.
9. Install wiring harness camshaft position connector (Figure 2, Item 14) to camshaft position sensor (Figure 2, Item 15). Engage the locking tab of the connector and reposition boot.
10. Install wiring harness oil pressure connector (Figure 2, Item 10) to oil pressure sensor (Figure 2, Item 11). Engage the locking tab of the connector and reposition boot.
11. Install wiring harness coolant temperature connector (Figure 2, Item 7) to coolant temperature sensor (Figure 2, Item 16). Engage the locking tab of the connector and reposition boot.



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**NOTE**

In a number of locations on the engine block, the ECM wiring harness is secured by P-clamps of varying sizes. All P-clamps are secured to the engine by a single mounting screw. Several of the P-clamps require spacers and/or vibration isolators for installation.

When installing ECM wiring harness use notes taken during removal to determine the size and location of P-clamps, spacers and vibration isolators required. Steps 12 to 13 describe the installation of a typical P-clamp to the engine.

12. Install P-clamp (Figure 4, Item 2) and spacer (Figure 4, Item 1) (if required) to ECM wiring harness (Figure 4, Item 4) at the approximate location where ECM wiring harness will be secured to the engine.
13. Align mounting holes in P-clamp (Figure 4, Item 2), spacer (Figure 4, Item 1) (if required), and engine. Install mounting screw (Figure 4, Item 3).

**NOTE**

ECM wiring harness may be attached at some points to engine and to other wiring harnesses with wire ties. Use tags applied during removal to assist in installation.

14. Install wire ties (not shown) as required to secure ECM wiring harness (Figure 1) to other components of the generator set.
15. Install left-side body panel (WP 0032, Remove/Install Left-Side Body Panel).
16. Install front body panel (WP 0030 Remove/Install Front Body Panel).
17. Install negative ground cable to right-hand battery (WP 0037 Remove/Install Batteries).
18. Close left- and right-side doors.
19. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
20. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
21. Repair as required.

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL ENGINE ECM SENSORS**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Sensor, air pressure (WP 0156, Repair Parts List, Figure 51, Item 5)

Sensor, camshaft position (WP 0156, Figure 51, Item 16)

Sensor, coolant temperature (WP 0156, Figure 51, Item 8)

Sensor, crankshaft position (WP 0156, Figure 51, Item 10)

Sensor, pressure and temperature, intake (WP 0156, Figure 51, Item 1)

Sensor, water (WP 0118, Repair Parts List, Figure 13, Item 8)

Switch, oil pressure (WP 0156, Figure 51, Item 13)

Antifreeze, ethylene glycol (WP 0180, Expendable and Durable Items List, Item 2)

Cleaning compound, electrical contact (WP 0180, Item 9)

Cloth, cleaning, electronics (WP 0180, Item 13)

Grease, electrically conductive (WP 0180, Item 22)

Lubricating oil, engine (WP 0180, Item 25)

Rag, wiping (WP 0180, Item 33)

**Personnel Required**

91D (1)

**References**

WP 0030, Remove/Install Front Body Panel

WP 0048, Replace Fuel Filter/Water Separator Element

WP 0066, Remove/Install 50/60 Hz Engine Assembly

WP 0067, Remove/Install 400 Hz Engine Assembly

WP 0087, Remove/Install Engine ECM Wiring Harness

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

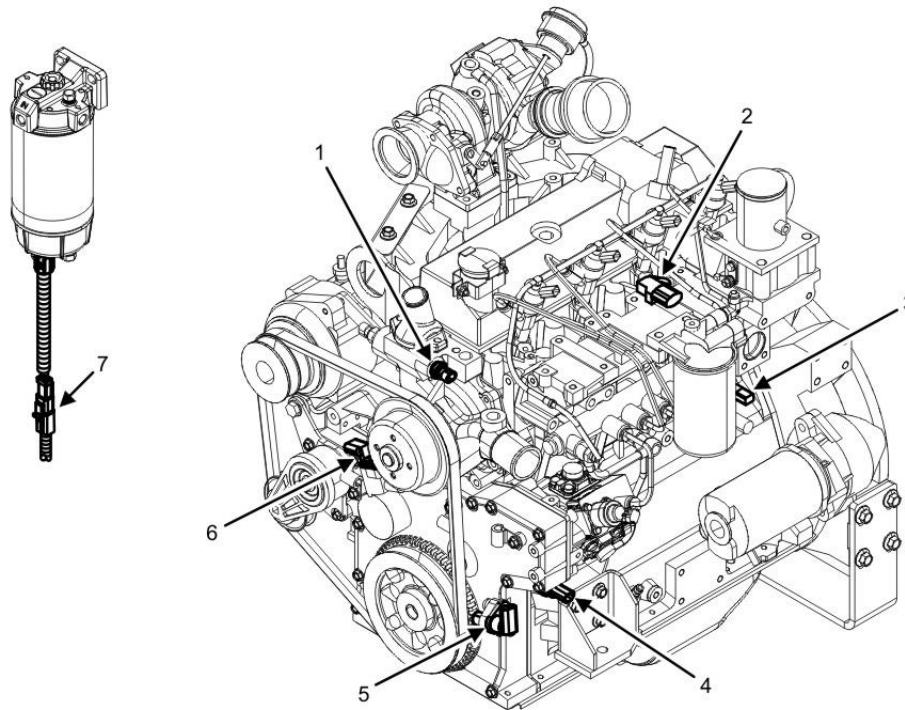
Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Front body panel removed (WP 0030, Remove/Install Front Body Panel)

**REMOVE/INSTALL ENGINE ECM SENSORS****NOTE**

There are seven sensors mounted to the engine to send signals to the engine ECM.



**Figure 1. ECM Sensors — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left-side doors and locate ECM sensors (Figure 1).

**NOTE**

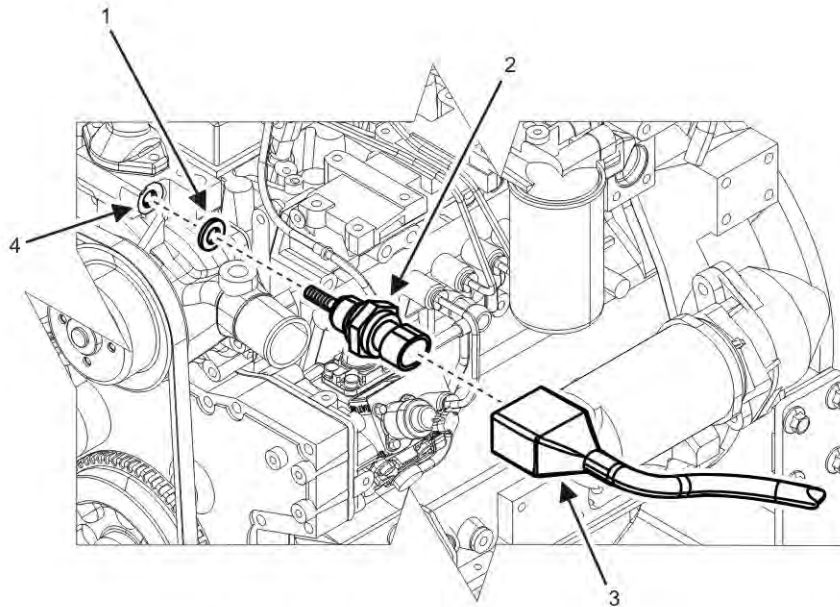
ECM sensors are installed by four methods. In Method 1, the sensor is threaded directly into the engine and sealed by a sealing washer. Method 2 mounts the sensor directly to its mounting location by a single screw without using an additional seal of any kind. Method 3 uses a sealing O-ring and mounting screw to secure the sensor to the engine. In Method 4, the sensor mounts directly to its mounting location with a sealing washer and integral connector. Table 1 identifies the sensors, their location, and their removal/installation method. Examples of the four removal/installation methods are described below.

3. Determine the ECM sensor (Figure 1) to be replaced and the installation method required from Table 1.

**END OF TASK**

Table 1. ECM Sensors.

FIGURE 1 FIND #	SENSOR	SENSOR LOCATION ON ENGINE	METHOD	MOUNTING SCREW	O-RING
1	Coolant temperature	Top front of cylinder head	1	no	yes
2	Intake manifold temperature	Top center of intake manifold	2	yes	no
3	Ambient air pressure	Intake side of engine	2	yes	no
4	Oil pressure	Intake side of engine	3	yes	yes
5	Crankshaft position	Front cover	3	yes	yes
6	Camshaft position	Front cover	3	yes	yes
7	Fuel/Water	Fuel filter/water separator	4	no	yes

**Remove Engine ECM Sensors Method 1 — Coolant Temperature Sensor****Figure 2. Method 1 (Coolant Temperature Sensor Shown).**

1. Disconnect wiring harness connector (Figure 2, Item 3) from coolant temperature sensor (Figure 2, Item 2).
2. Remove coolant temperature sensor (Figure 2, Item 2) and O-ring (Figure 2, Item 1) from engine. Discard O-ring (Figure 2, Item 1).

**END OF TASK**

---

**Inspect Engine ECM Sensors Method 1 — Coolant Temperature Sensor**

1. Inspect coolant temperature sensor (Figure 2, Item 2) for signs of obvious damage. Replace damaged coolant temperature sensor (Figure 2, Item 2).
2. Inspect wiring harness connector (Figure 2, Item 3) for signs of obvious damage. Replace ECM wiring harness if connector is damaged (WP 0087, Remove/Install Engine ECM Wiring Harness).
3. Clean coolant temperature sensor mounting position (Figure 2, Item 4) on front gear cover with electrical contact cleaner.

**END OF TASK****Install Engine ECM Sensors Method 1 — Coolant Temperature Sensor****NOTE**

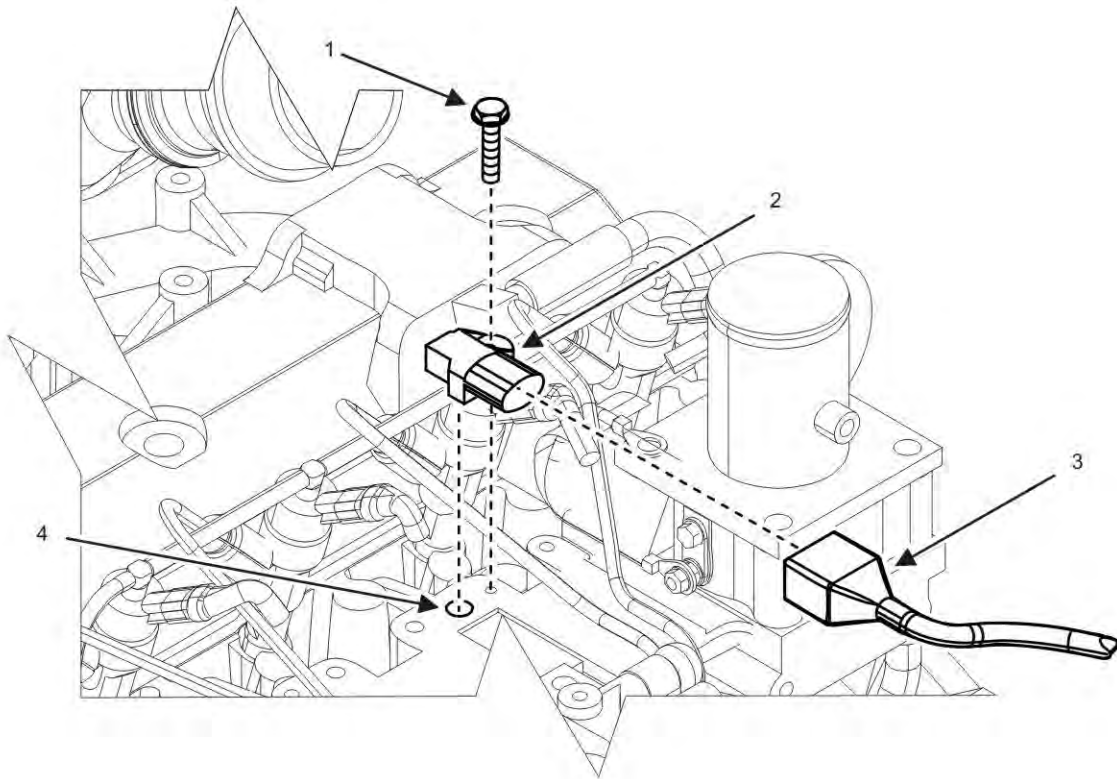
Coolant temperature sensor (Figure 2, Item 2) is a fixed-depth sensor. There is no provision for adjustment.

1. Apply a light coat of clean coolant to new O-ring (Figure 2, Item 1).
2. Install new O-ring (Figure 2, Item 1) to coolant temperature sensor (Figure 2, Item 2).
3. Install coolant temperature sensor (Figure 2, Item 2) to its mounting location (Figure 2, Item 4) on engine.
4. Apply a small amount of electrically conductive grease to socket on coolant temperature sensor (Figure 2, Item 2).
5. Connect wiring harness connector (Figure 2, Item 3) to coolant temperature sensor (Figure 2, Item 2).
6. Close left-side door.
7. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
8. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
9. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
10. Repair as required.

**END OF TASK**

**Remove Engine ECM Sensors Method 2 — Intake Manifold Temperature Sensor and Ambient Air Pressure Sensor****NOTE**

Method 2 applies to both the intake manifold temperature sensor and the ambient air pressure sensor. Removal, inspection, and installation of the intake manifold temperature sensor are shown. The steps are the same for the ambient air pressure sensor unless otherwise noted.



**Figure 3. Method 2 (Intake Manifold Temperature Sensor Shown).**

1. Disconnect wiring harness connector (Figure 3, Item 3) from intake manifold temperature sensor (Figure 3, Item 2).
2. Remove intake manifold temperature sensor (Figure 3, Item 2) from engine by removing mounting screw (Figure 3, Item 1).

**END OF TASK**

---

**Inspect Engine ECM Sensors Method 2 — Intake Manifold Temperature Sensor and Ambient Air Pressure Sensor**

1. Inspect intake manifold temperature sensor (Figure 3, Item 2) for signs of obvious damage. Replace damaged intake manifold temperature sensor (Figure 3, Item 2).
2. Inspect wiring harness connector (Figure 3, Item 3) for signs of obvious damage. Replace ECM wiring harness if connector is damaged (WP 0087, Remove/Install Engine ECM Wiring Harness).
3. Clean intake manifold temperature sensor mounting position (Figure 3, Item 4) on intake manifold with electrical contact cleaner.

**END OF TASK****Install Engine ECM Sensors Method 2 — Intake Manifold Temperature Sensor and Ambient Air Pressure Sensor****NOTE**

There is no provision for adjustment of the intake manifold temperature sensor.

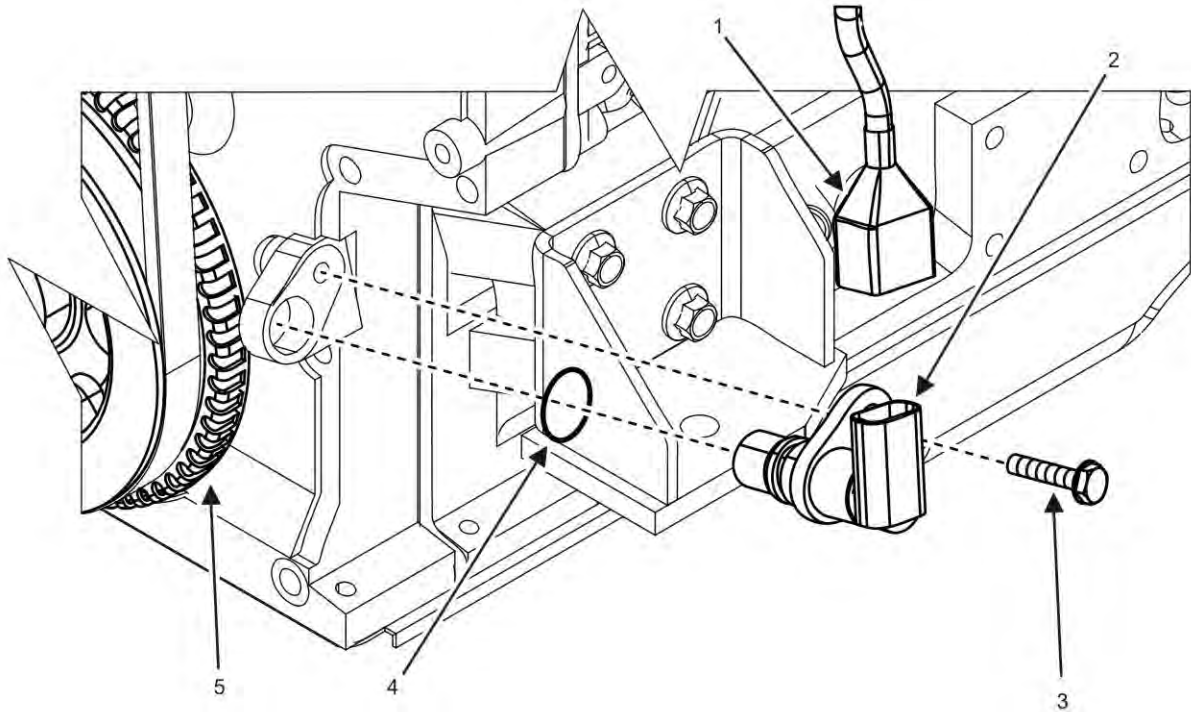
1. Position intake manifold temperature sensor (Figure 3, Item 2) to mounting location on intake manifold and secure by installing mounting screw (Figure 3, Item 1).
2. Apply a small amount of electrically conductive grease to socket on intake manifold temperature sensor (Figure 3, Item 2).
3. Connect wiring harness connector (Figure 3, Item 3) to intake manifold temperature sensor (Figure 3, Item 2).
4. Close left-side door.
5. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
6. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
7. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
8. Repair as required.

**END OF TASK**



**Remove Engine ECM Sensors Method 3 — Oil Pressure Sensor, Crankshaft Position Sensor, and Camshaft Position Sensor****NOTE**

Method 3 applies to the oil pressure sensor, the crankshaft position sensor, and the camshaft position sensor. Removal, inspection, and installation of the crankshaft position sensor are shown. The steps are the same for the camshaft position sensor and the oil pressure sensor unless otherwise noted.



**Figure 4. Method 3 (Crankshaft Position Sensor Shown).**

1. Disconnect wiring harness connector (Figure 4, Item 1) from crankshaft position sensor (Figure 4, Item 2).
2. Remove screw (Figure 4, Item 3) that secures crankshaft position sensor (Figure 4, Item 2) to its mounting position on engine.
3. Remove crankshaft position sensor (Figure 4, Item 2) and O-ring (Figure 4, Item 4) from engine. Discard O-ring (Figure 4, Item 4).

**END OF TASK****Inspect Engine ECM Sensors Method 3 — Oil Pressure Sensor, Crankshaft Position Sensor, and Camshaft Position Sensor**

1. Inspect crankshaft position sensor (Figure 4, Item 2) for signs of obvious damage. Replace damaged crankshaft position sensor (Figure 4, Item 2).
2. Inspect wiring harness connector (Figure 4, Item 1) for signs of obvious damage. Replace ECM wiring harness if connector is damaged (WP 0087, Remove/Install Engine ECM Wiring Harness).

**NOTE**

Step 3 applies to the crankshaft position sensor only. If removing the camshaft position sensor or the oil pressure sensor, skip to step 4.

3. Inspect crankshaft speed indicator ring (Figure 4, Item 5) for broken or missing teeth. Replace engine if crankshaft speed indicator ring is damaged (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).
4. Clean mounting position on engine with electrical contact cleaner.

**END OF TASK****Install Engine ECM Sensors Method 3 — Oil Pressure Sensor, Crankshaft Position Sensor, and Camshaft Position Sensor****NOTE**

Crankshaft position sensor (Figure 4, Item 2) is a fixed-depth sensor. There is no provision for adjustment.

1. Apply a light coat of clean engine oil to new O-ring (Figure 4, Item 4).
2. Install new O-ring (Figure 4, Item 4) to crankshaft position sensor (Figure 4, Item 2).
3. Position crankshaft position sensor (Figure 4, Item 2) to its mounting location on engine.
4. Secure crankshaft position sensor (Figure 4, Item 2) to engine by installing mounting screw (Figure 4, Item 3).

**NOTE**

Crankshaft position sensor (Figure 4, Item 2) is the only ECM sensor that requires an additional measurement step to complete the installation.

5. Proceed to step 7 if installing the crankshaft position sensor.
6. Proceed to step 9 if an installation Method 3 sensor other than crankshaft position sensor is being installed.

**NOTE**

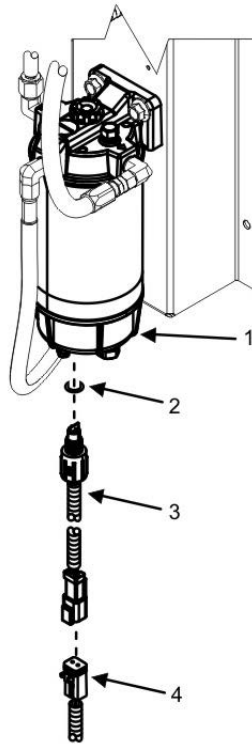
If, after the crankshaft position sensor has been replaced, the air gap measurement between crankshaft position sensor and crankshaft speed indicator ring is not within specification, replace crankshaft position sensor with another one. There is no method of adjustment. Air gap specification is 0.032 – 0.060 in (0.8 – 1.5 mm).

7. Remove front access panel (WP 0030, Remove/Install Front Body Panel) and measure gap between crankshaft position sensor (Figure 4, Item 2) and crankshaft speed indicator ring (Figure 4, Item 5) using a thickness gage. Compare to specification.
8. Replace crankshaft position sensor (Figure 4, Item 2) if air gap is not within specification. Install front access panel (WP 0030, Remove/Install Front Body Panel).
9. Apply a small amount of electrically conductive grease to socket on crankshaft position sensor (Figure 4, Item 2).
10. Connect wiring harness connector (Figure 4, Item 1) to crankshaft position sensor (Figure 4, Item 2).
11. Close left-side door.
12. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
13. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).

14. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
15. Repair as required.

#### END OF TASK

#### Remove Engine ECM Sensors Method 4 — Fuel/Water Sensor



**Figure 5. Method 4 (Fuel/Water Sensor).**

1. Drain fuel and water from water bowl (Figure 5, Item 1) of fuel filter/water separator (WP 0048, Replace Fuel Filter/Water Separator Element).
2. Disconnect wiring harness (Figure 5, Item 4) connector from fuel/water sensor (Figure 5, Item 3).
3. Unscrew and remove fuel/water sensor (Figure 5, Item 3) and O-ring (Figure 5, Item 2) from water bowl (Figure 5, Item 1) of fuel filter/water separator. Discard O-ring (Figure 5, Item 2).

#### END OF TASK

#### Inspect Engine ECM Sensors Method 4 — Fuel/Water Sensor

1. Inspect fuel/water sensor (Figure 5, Item 3) for signs of obvious damage, and replace as required.
2. Inspect water bowl (Figure 5, Item 1) for signs of obvious damage. Replace as required (WP 0048, Replace Fuel Filter/Water Separator).
3. Clean sensor port in water bowl (Figure 5, Item 1) with a wiping rag to remove any dirt and/or debris.

#### END OF TASK

---

**Install Engine ECM Sensors Method 4 — Fuel/Water Sensor**

1. Apply a thin coat of clean fuel to new O-ring (Figure 5, Item 2) and install new O-ring (Figure 5, Item 2) onto fuel/water sensor (Figure 5, Item 3).
2. Install new fuel/water sensor (Figure 5, Item 3) into water bowl (Figure 5, Item 1).
3. Connect wiring harness (Figure 5, Item 4) connector to fuel/water sensor (Figure 5, Item 3).
4. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
5. Prime fuel system (TM 9-6115-752-10) to fill fuel filter/water separator with fuel and remove air from the fuel system.
6. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
7. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
8. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL VALVE COVER**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Cover, valve (WP 0158, Repair Parts List, Figure 53, Item 1)

Nut, lock (3) (WP 0158, Figure 53, Item 7)

Seal, O-ring (WP 0158, Figure 53, Item 4)

Detergent, general purpose (WP 0180, Expendable and Durable Items List, Item 18)

Rag, wiping (WP 0180, Item 33)

**Personnel Required**

91D (1)

**Equipment Conditions**

Engine control switch OFF (TM 9 6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

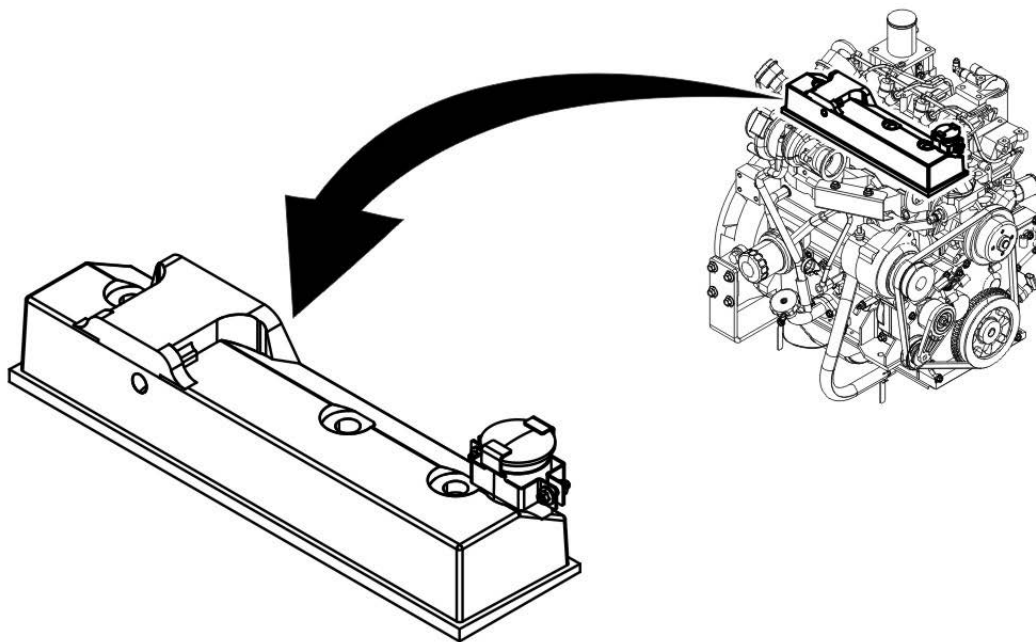
Top body panel removed (WP 0029, Remove/Install Top Body Panel)

Front and rear safety grilles removed through right-side door (WP 0033, Remove/Install Right-Side Body Panels)

V-band clamp on turbine outlet of turbocharger removed (WP 0085, Remove/Install Turbocharger)

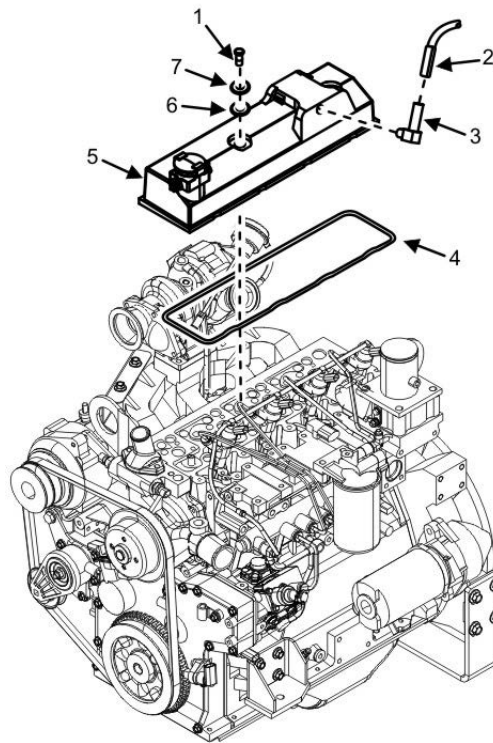
Flex pipe removed (WP 0084, Remove/Install Muffler)

Hose clamp on charge air cooler supply tube loosened and re-positioned (WP 0021, Remove/Install Charge Air Cooler)

**REMOVE/INSTALL VALVE COVER****Remove Valve Cover**

**Figure 1. Valve Cover — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open right-side door and locate valve cover (Figure 1).
3. Turn turbine outlet hose at charge air cooler supply tube toward top of generator set (WP 0021, Remove/Install Charge Air Cooler) to gain access to valve cover.



**Figure 2. Valve Cover — Removal.**

4. Pull coalescer supply hose (Figure 2, Item 2) from elbow (Figure 2, Item 3).
5. Remove elbow (Figure 2, Item 3) from valve cover (Figure 2, Item 5).
6. Remove three screws (Figure 2, Item 1), flat washers (Figure 2, Item 7), and O-ring seals (Figure 2, Item 6). Discard O-ring seals (Figure 2, Item 6).
7. Remove valve cover (Figure 2, Item 5) and gasket (Figure 2, Item 4) from engine and out right-side door. Discard gasket (Figure 2, Item 4).

#### **END OF TASK**

#### **Inspect Valve Cover**

### **WARNING**

Water solution hot enough to clean engine parts is hot enough to cause scald injury to personnel. Be sure to wear protective clothing, gloves, and goggles while cleaning pistons. Failure to comply may cause injury or death to personnel.

1. Clean valve cover (Figure 2, Item 5) with a strong solution of detergent in hot water.
2. Dry valve cover (Figure 2, Item 5) with wiping rags.
3. Inspect valve cover (Figure 2, Item 5) for cracks and other damage.
4. Replace valve cover (Figure 2, Item 5) if cracked or damaged.

#### **END OF TASK**

---

**Install Valve Cover**

1. Install new gasket (Figure 2, Item 4) to valve cover (Figure 2, Item 5).
2. Install valve cover (Figure 2, Item 5), three new O-ring seals (Figure 2, Item 6), three flat washers (Figure 2, Item 7), and three screws (Figure 2, Item 1).
3. Tighten screws (Figure 2, Item 1) to 80 in/lb (9 Nm).
4. Install elbow (Figure 2, Item 3) to valve cover (Figure 2, Item 5).
5. Install coalescer supply hose (Figure 2, Item 2) to elbow (Figure 2, Item 3).
6. Reposition and tighten hose clamp at charge air cooler supply tube (WP 0021, Remove/Install Charge Air Cooler).
7. Install air intake hose to turbocharger turbine inlet (WP 0019, Remove/Install Air Intake Hose Assemblies).
8. Turn turbine outlet hose at charge air cooler supply tube to align with turbocharger turbine outlet and secure by installing V-band clamp (WP 0085, Remove/Install Turbocharger).
9. Install front and rear safety grilles at right-side door (WP 0033, Remove/Install Right-Side Body Panels).
10. Install top body panel (WP 0029, Remove/Install Top Body Panel).
11. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
12. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
13. Start engine and check for proper operation (TM 9-6115-752-10).
14. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**CHECK/ADJUST VALVES**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Seal, O-ring (WP 0158, Repair Parts List, Figure 53, Item 4)

Lubricating oil, engine (WP 0180, Expendable and Durable Items List, Item 25)

Rag, wiping (WP 0180, Item 33)

**Personnel Required**

91D (2)

**Equipment Conditions**

Engine control switch OFF (TM 9 6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

Front body panel removed (WP 0030, Remove/Install Front Body Panel)

Valve cover removed (WP 0089, Remove/Install Valve Cover)

Battery-charging alternator belt removed (WP 0080, Remove/Install Battery-Charging Alternator Belt)

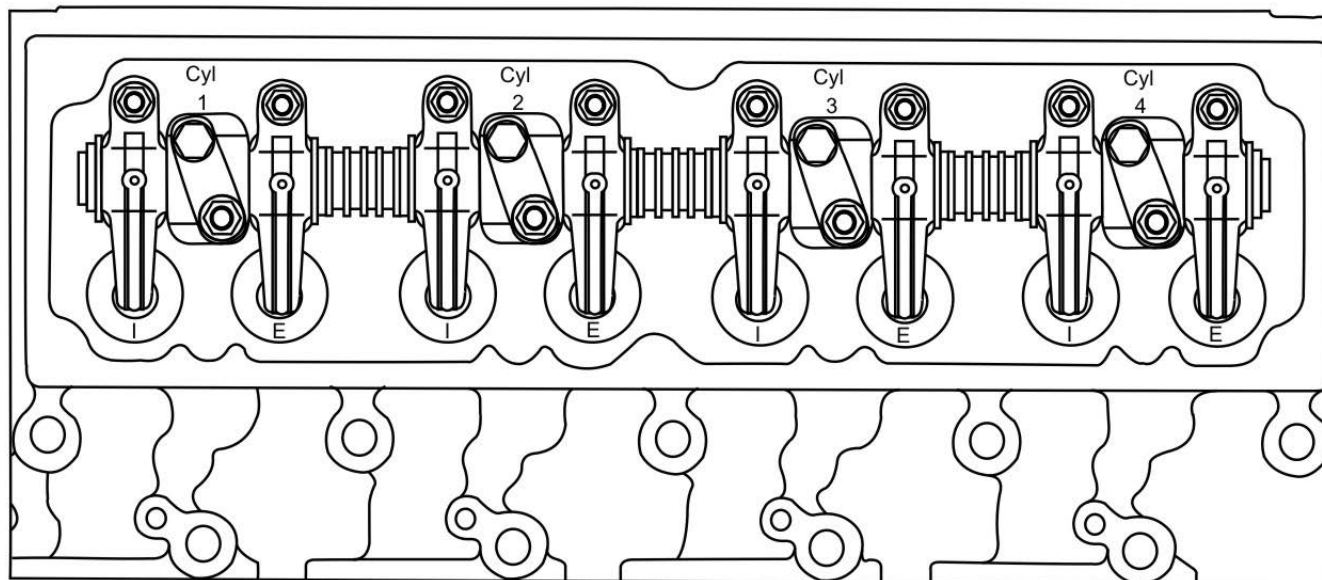
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## CHECK/ADJUST VALVES

### Check/Adjust Valves

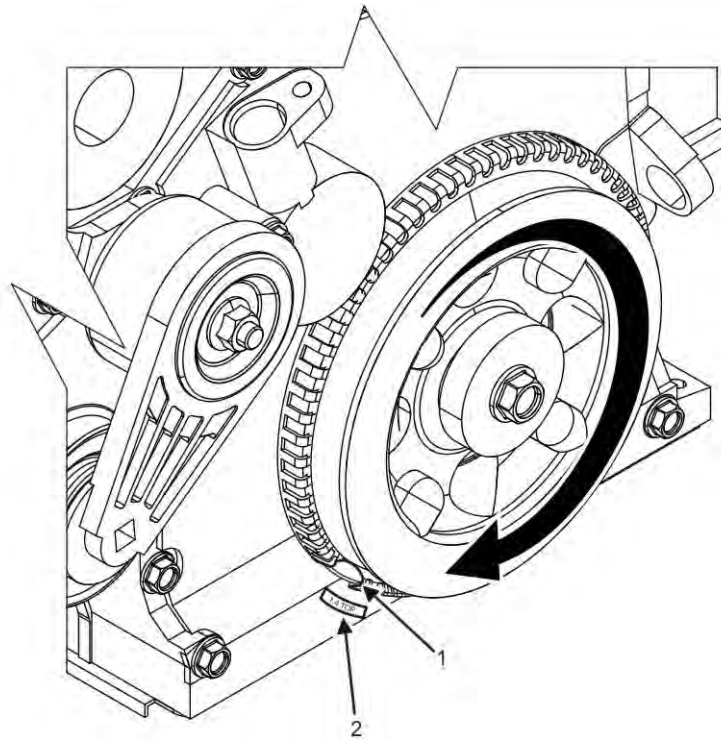
#### NOTE

Figure 1 uses the following abbreviations: cylinder (Cyl), intake (I), and exhaust (E).



**Figure 1. Valve Location by Cylinder.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Open left- and right-side doors.
3. Locate engine valves (Figure 1).



**Figure 2. Crankshaft Timing Mark and Pointer.**

### **NOTE**

Compression TDC is achieved when both rocker arms on cylinder number one are loose. Number one cylinder is on water pump-end of engine. The firing order of the engine cylinders is 1-2-4-3.

4. Rotate crankshaft pulley to establish compression TDC in cylinder 1.
5. Continue to rotate to the following positions:
  - a. Engines with a timing pointer:
    - (1) Rotate crankshaft pulley clockwise (when facing front of engine).
    - (2) Align 1.4 TOP engraved mark (Figure 2, Item 2) on gear case cover with large opening on harmonic balancer (Figure 2, Item 1) on engine.
    - (3) Engraved mark on gear case cover will be marked with 1.4 TOP (Figure 2, Item 2).
  - b. Engines without a timing pointer:
    - (1) Rotate crankshaft pulley clockwise (when facing front of engine) until cylinder 4 intake valve begins to open.
    - (2) Wiggle rocker arm of cylinder 4 intake valve while rotating engine until rocker arm no longer moves. Stop rotating crankshaft.

## NOTE

Once TDC in cylinder 1 has been established, all valves can be adjusted in two moves of the crankshaft.

6. Check and/or adjust the following valves as required using Table 1 and Table 2 values:
  - a. Intake valves of cylinders 1 and 3.
  - b. Exhaust valves of cylinders 1 and 2.

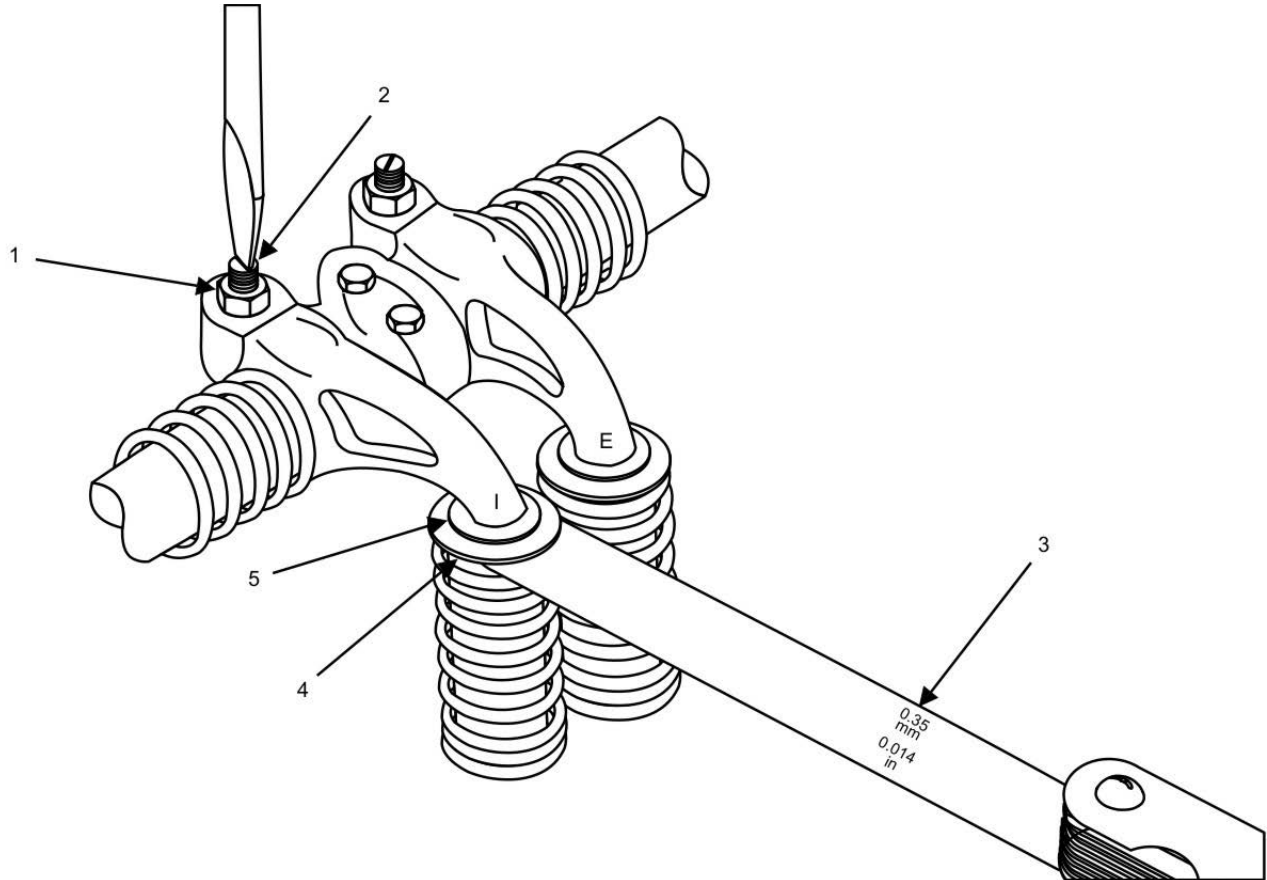


Figure 3. Valve Adjustment.

## NOTE

Valve clearance checks are often performed as a part of troubleshooting. Adjustment is not required during checks as long as the lash measurements are within the specification shown in Table 1.

Table 1. Valve Check Limits — Engine Hot or Cold.

CRANKSHAFT POSITION	CHECK RANGE FOR INTAKE VALVES 0.010 in to 0.019 in (0.250 mm to 0.475 mm)	CHECK RANGE FOR EXHAUST VALVES 0.015 in to 0.030 in (0.375 mm to 0.750 mm)
TDC	1 and 3	1 and 2
TDC + 360 degrees	2 and 4	3 and 4

**NOTE**

The procedure to adjust valve clearance is the same for all valves. The valve clearance specification for intake and exhaust valves is different. Adjust valves to specifications shown in Table 2. The following steps provide instruction to adjust one intake and one exhaust valve.

**Table 2. Valve Clearance — Engine Hot or Cold.**

<b>CRANKSHAFT POSITION</b>	<b>ADJUST INTAKE VALVES</b> use gage 0.014 in (0.35 mm)	<b>ADJUST EXHAUST VALVES</b> use gage 0.020 in (0.50 mm)
TDC	1 and 3	1 and 2
TDC + 360 degrees	2 and 4	3 and 4

7. Loosen locknut (Figure 3, Item 1) on adjustment screw (Figure 3, Item 2) of cylinder 1 intake valve.
8. Insert a 0.014-in (0.35-mm) feeler gage (Figure 3, Item 3) between intake valve stem (Figure 3, Item 4) and rocker arm (Figure 3, Item 5).

**NOTE**

If a slight drag on the feeler gage is felt when initially inserted, no adjustment is necessary.

9. Adjust clearance between valve stem (Figure 3, Item 4) and rocker arm (Figure 3, Item 5) by turning adjustment screw (Figure 3, Item 2) until a slight drag is felt on feeler gage.
10. Hold adjustment screw (Figure 3, Item 2) in position and tighten adjustment screw locknut (Figure 3, Item 1).
11. Withdraw feeler gage (Figure 3, Item 3) from rocker arm (Figure 3, Item 5) and valve stem (Figure 3, Item 4).
12. Insert feeler gage (Figure 3, Item 3) between intake valve stem (Figure 3, Item 4) and rocker arm (Figure 3, Item 5) of cylinder 1 to ensure adjustment was not lost when locknut (Figure 3, Item 1) was tightened.
  - a. Re-adjust valve if there is little or no drag on feeler gage.
  - b. Re-adjust valve if feeler gage cannot be inserted or if there is too much drag on feeler gage.
  - c. Valve is correctly adjusted if slight drag is felt on feeler gage.
13. Repeat steps 7 through 12 to adjust intake valve of cylinder 3.
14. Repeat steps 7 through 12 using a 0.020-in (0.50-mm) feeler gage to adjust exhaust valves of cylinders 1 and 2.
15. Rotate engine crankshaft an additional 360 degrees clockwise beyond TDC (when facing front of engine) to position remaining valves for adjustment.
16. Repeat steps 7 through 12 using a 0.014-in (0.35-mm) feeler gage to adjust intake valves of cylinders 2 and 4.
17. Repeat steps 7 through 12 using a 0.020-in (0.50-mm) feeler gage to adjust exhaust valves of cylinders 3 and 4.
18. Install battery-charging alternator belt (WP 0080, Remove/Install Battery-Charging Alternator Belt).
19. Install valve cover (WP 0089, Remove/Install Valve Cover).
20. Install front body panel (WP 0030, Remove/Install Front Body Panel).
21. Install negative ground cable to right-hand battery (WP 0037, Remove/Install Batteries).
22. Close left- and right-side doors.
23. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
24. Start engine and check for proper operation (TM 9-6115-752-10). Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).

25. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL FLYWHEEL**

---

**INITIAL SETUP:****Test Equipment**

Kit, Crack Detection (WP 0179, Table 2, Item 15)

**Tools and Special Tools**

Installer, Crankshaft Seal (WP 0179, Table 2, Item 14)

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 FT-LB (WP 0179, Table 2, Item 38)

**Materials/Parts**

Flywheel (1) (WP 0169, Repair Parts List, Figure 64, Item 1)

Seal, oil (WP 0169, Figure 64, Item 9)

Brush, wire, scratch, brass (WP 0180, Expendable and Durable Items List, Item 7)

Cleaning compound, solvent (WP 0180, Item 11)

Cloth, abrasive, crocus (WP 0180, Item 12)

Grease, general purpose (WP 0180, Item 23)

Lubricating oil, engine (WP 0180, Item 25)

Rag, wiping (WP 0180, Item 33)

**Personnel Required**

91D (1)

Assistant (1)

**References**

Not Applicable

**Equipment Conditions**

Engine control switch OFF (TM 9 6115-752-10, WP 0005)

Engine cool

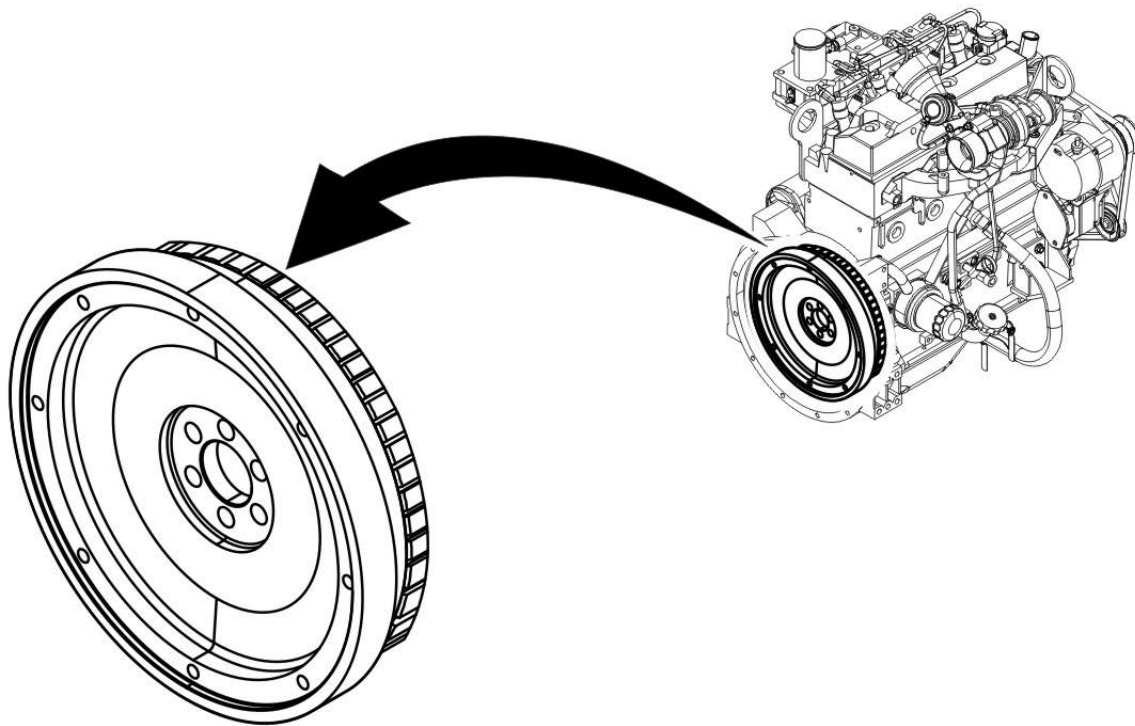
Engine removed and mounted on a suitable stand (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly)

Starter removed (WP 0078, Remove/Install Starter)

**REMOVE/INSTALL FLYWHEEL****WARNING**

- The flywheel is heavy and must be supported during removal/installation. Failure to comply may cause injury or death to personnel.
- The component being lifted weighs 50 lb (23 kg). Two personnel or a suitable lifting device are necessary to lift component. Failure to comply may cause injury or death to personnel.

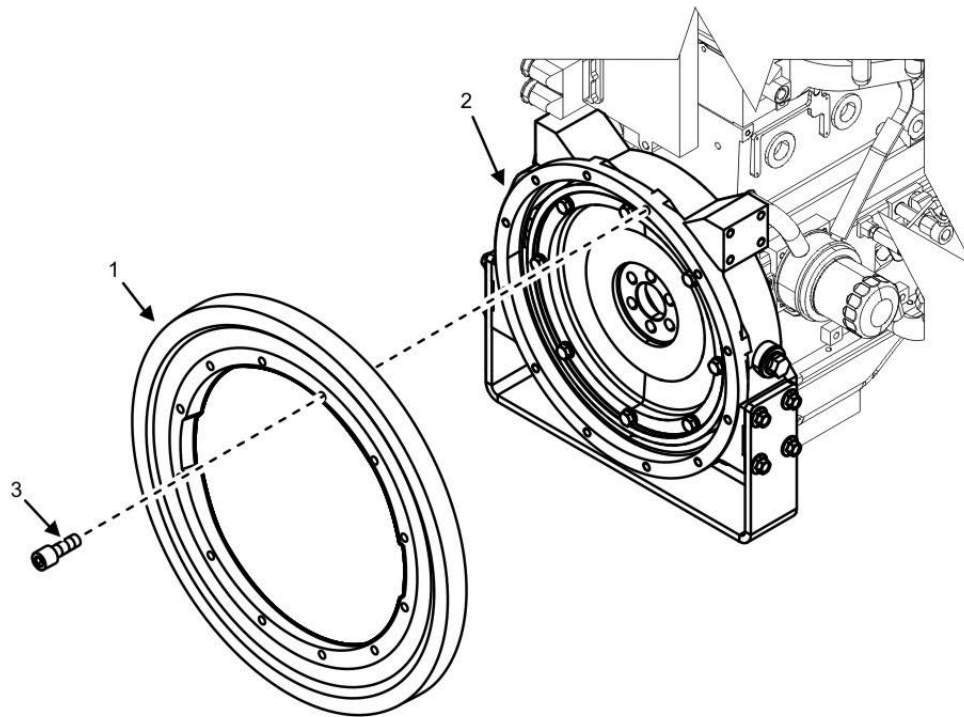
## Remove Flywheel



**Figure 1. Flywheel — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate flywheel (Figure 1).





**Figure 2. Flywheel Flange — Removal.**

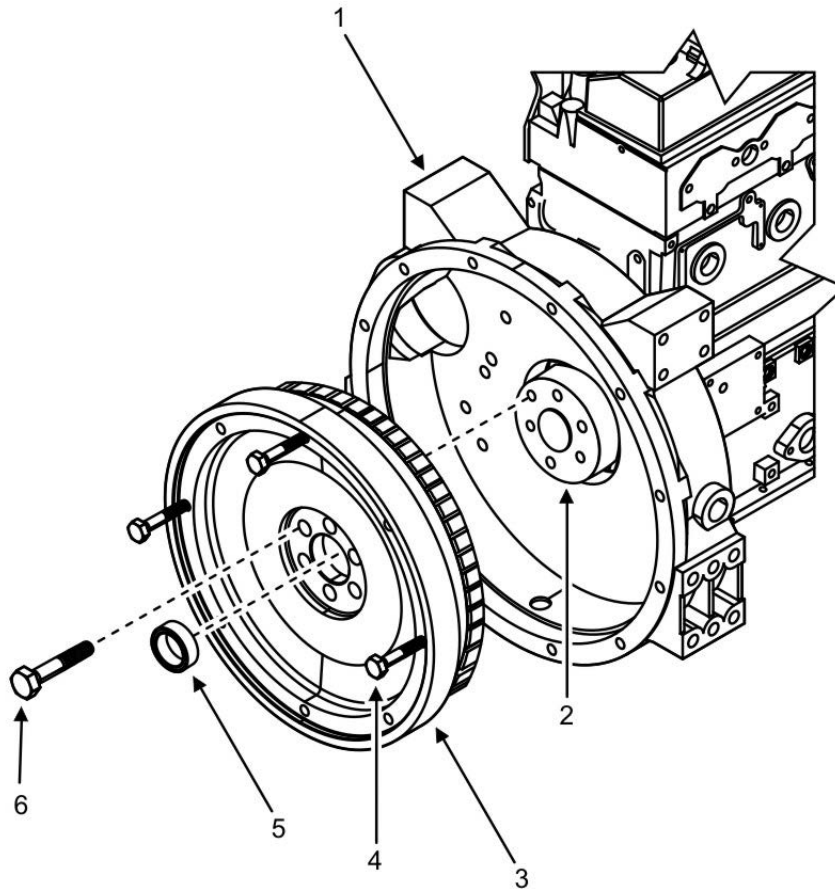
### NOTE

Removal procedure of the flywheel on the units equipped with 50/60 Hz and 400 Hz AC generators is similar with the exception that the 400 Hz generators require a flywheel flange (Figure 2, Item 1) to mate the engine to the AC generator.

If removing the flywheel from a unit equipped with a 400 Hz AC generator, flywheel flange (Figure 2, Item 1) removal is illustrated in Figure 2 and described in removal steps 3 through 5.

If removing the flywheel from a unit equipped with a 50/60 Hz AC generator, flywheel flange (Figure 2, Item 1) removal is not required. Proceed to Figure 3 and removal step 6.

3. Remove 12 flywheel flange mounting bolts (Figure 2, Item 3) while an assistant supports flywheel flange (Figure 2, Item 1).
4. Remove flywheel flange (Figure 2, Item 1) from flywheel housing (Figure 2, Item 2) and place on a suitable work surface.
5. Place wiping rags at bottom of flywheel housing (Figure 3, Item 1) to prevent flywheel (Figure 3, Item 3) from contacting flywheel housing (Figure 3, Item 1) when flywheel mounting bolts (Figure 3, Item 6) are removed.



**Figure 3. Flywheel — Removal.**

6. Install three bolts (Figure 3, Item 4) used to attach AC generator drive plate to flywheel (Figure 3, Item 3) (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly) evenly spaced 60 degrees apart on outside edge of flywheel (Figure 3, Item 3).

### **CAUTION**

Proper alignment of flywheel and crankshaft hub is critical. Apply indexing marks to both flywheel and crankshaft hub prior to removal of flywheel to ensure proper alignment of components at installation. Failure to comply may cause damage to equipment.

7. Apply indexing marks to flywheel (Figure 3, Item 3) and crankshaft hub (Figure 3, Item 2) to ensure proper alignment during assembly.
8. Attach a suitable lifting device to three bolts (Figure 3, Item 4) and take up slack.
9. Instruct an assistant to block flywheel (Figure 3, Item 3) from turning by using a breaker bar and barring tool.
10. Loosen six flywheel mounting bolts (Figure 3, Item 6) using a crossing pattern.
11. Remove six flywheel mounting bolts (Figure 3, Item 6) using a crossing pattern.
12. Remove flywheel (Figure 3, Item 3) and coupling (Figure 3, Item 5) from crankshaft hub (Figure 3, Item 2). Push flywheel (Figure 3, Item 3) from crankshaft hub (Figure 3, Item 2) through starter port if necessary.
13. Place flywheel (Figure 3, Item 3) on a suitable work surface. Remove lifting device.

14. Remove three bolts (Figure 3, Item 4) installed in step 6. Retain three bolts (Figure 3, Item 4) to reuse during installation.

## END OF TASK

### Inspect Flywheel

1. Use a wire brush to clean crankshaft pilot bore in flywheel (Figure 3, Item 3).

## WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

2. Clean flywheel (Figure 3, Item 3), flywheel flange (Figure 2, Item 1), coupling (Figure 3, Item 5), and inside of flywheel housing (Figure 3, Item 1) using dry cleaning solvent.
3. Inspect coupling (Figure 3, Item 5) for signs of obvious damage. Replace as required.
4. Inspect flywheel flange (Figure 2, Item 1) for signs of obvious damage. Replace damaged flywheel flange (Figure 2, Item 1).
5. Inspect flywheel housing (Figure 3, Item 1) for signs of obvious damage. Replace engine (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly) if flywheel housing is damaged.
6. Inspect flywheel (Figure 3, Item 3) for nicks or burrs.
7. Remove minor nicks or burrs using crocus cloth.
8. Inspect flywheel (Figure 3, Item 3) for broken teeth.
9. Replace flywheel (Figure 3, Item 3) if teeth are broken.

## WARNING

Do not reuse a cracked flywheel. Cracked flywheels can break causing personal injury. Failure to comply may cause injury or death to personnel.

10. Check for cracks in flywheel (Figure 3, Item 3) by using a crack detection kit. Follow manufacturer's instruction included in the kit. Replace cracked flywheel (Figure 3, Item 3).

## END OF TASK

### Install Flywheel

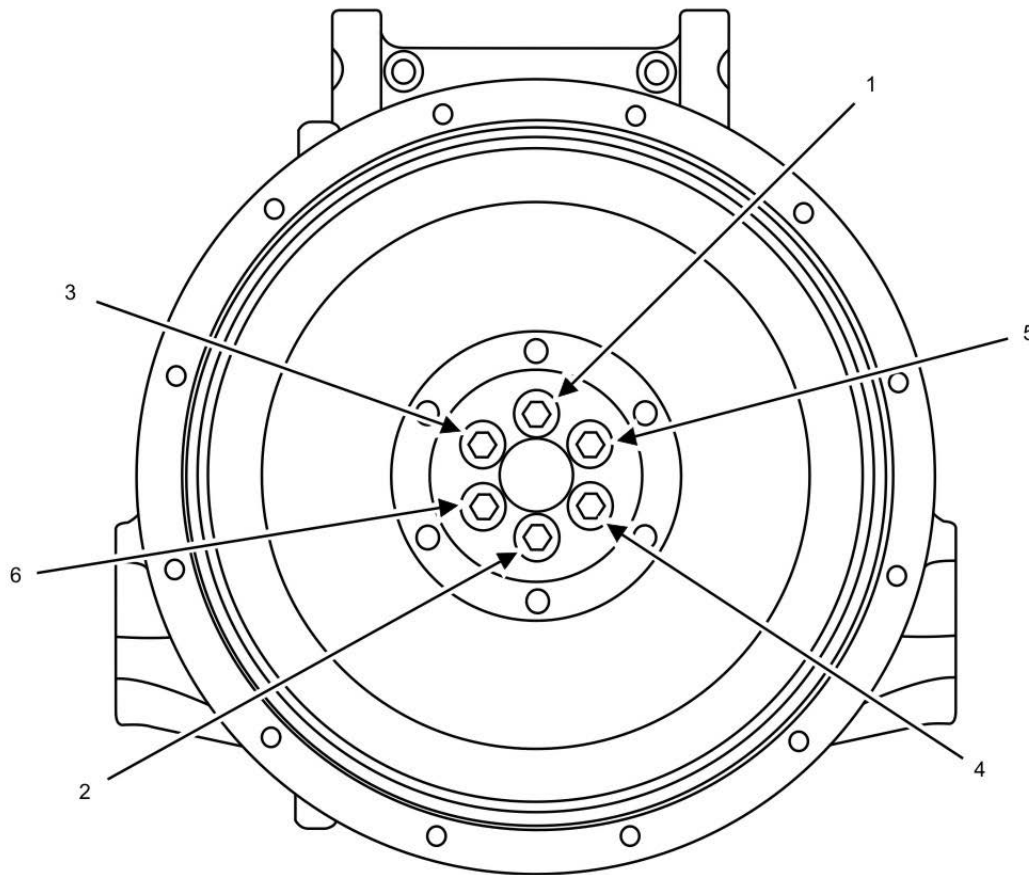
1. Apply a coat of clean engine oil to six flywheel mounting bolts (Figure 3, Item 6) prior to installation.
2. Place wiping rags at bottom of flywheel housing (Figure 3, Item 1) to prevent flywheel (Figure 3, Item 3) from contacting flywheel housing (Figure 3, Item 1) during installation.

## NOTE

If a replacement flywheel (Figure 3, Item 3) is to be used, transfer the index mark made on the original flywheel (Figure 3, Item 3) to the new flywheel (Figure 3, Item 3).

3. Install three bolts (Figure 3, Item 4) used to attach AC generator drive plate to flywheel housing (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly) evenly spaced at 60 degrees on outside edge of flywheel (Figure 3, Item 3).
4. Attach a suitable lifting device to three bolts (Figure 3, Item 4).

5. Lift flywheel (Figure 3, Item 3) and position flywheel (Figure 3, Item 3) and coupling (Figure 3, Item 5) to mounting location on crankshaft hub (Figure 3, Item 2).
6. Align indexing marks (applied during removal) and mounting holes of flywheel (Figure 3, Item 3) and crankshaft hub (Figure 3, Item 2).
7. Install six flywheel mounting bolts (Figure 3, Item 6) finger-tight to secure flywheel (Figure 3, Item 3) to crankshaft hub (Figure 3, Item 2) finger-tight. Remove lifting device.



**Figure 4. Flywheel — Torque Pattern.**

8. Instruct an assistant to block flywheel (Figure 3, Item 3) from turning by using a breaker bar and barring tool.
9. Tighten flywheel mounting bolts (Figure 3, Item 6) using the pattern shown in Figure 4 in two steps:
  - a Tighten to 80 ft/lb (108 Nm).
  - b Tighten to 141 ft/lb (191 Nm).
10. Remove three bolts (Figure 3, Item 4) installed in step 3. Retain three bolts (Figure 3, Item 4) to use at installation of engine (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).

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**NOTE**

Installation procedure of the flywheel on the units equipped with 50/60 Hz and 400 Hz AC generators is similar with the exception that the 400 Hz generators require a flywheel flange (Figure 2, Item 1) to mate the engine to the AC generator.

If installing the flywheel to a unit equipped with a 400 Hz AC generator, installation of the flywheel flange (Figure 2, Item 1) is illustrated in Figure 2 and described in installation steps 11 through 13.

If installing the flywheel to a unit equipped with a 50/60 Hz AC generator, a flywheel flange (Figure 2, Item 1) is not required. Proceed to removal step 14.

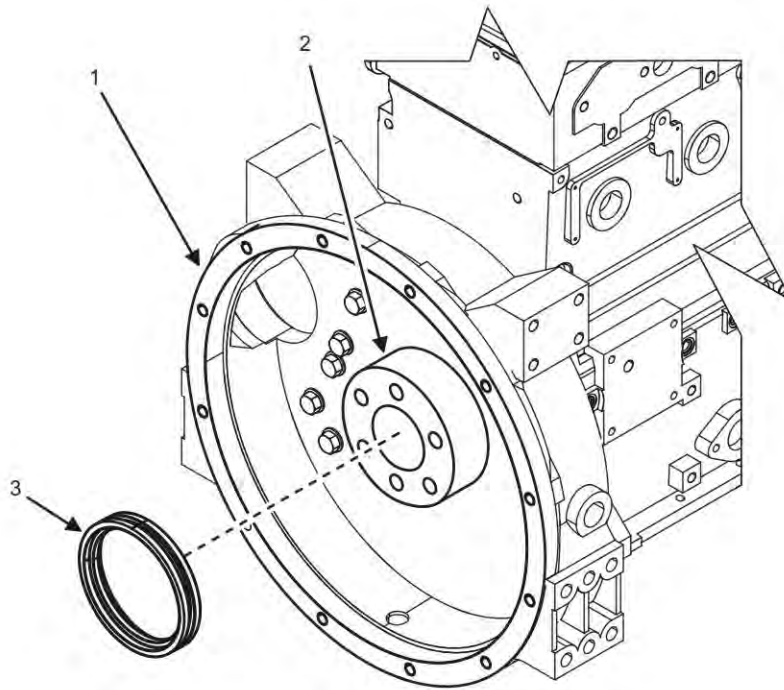
11. Position flywheel flange (Figure 2, Item 1), with the help of an assistant, to its mounting location on flywheel housing (Figure 2, Item 2) and align the mounting holes.
12. Install 12 flywheel flange mounting bolts (Figure 2, Item 3) to secure flywheel flange (Figure 2, Item 1) to flywheel housing (Figure 2, Item 2) finger-tight.
13. Tighten flywheel flange mounting bolts (Figure 2, Item 3) to 38 ft/lb (53 Nm) using a crossing pattern.
14. Install starter (WP 0078, Remove/Install Starter).
15. Install engine (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).
16. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
17. Start engine and check for proper operation (TM 9-6115-752-10).
18. Repair as required.
19. Dispose of captured fuel and soiled rags IAW local SOP.

**END OF TASK****Remove Rear Crankshaft Oil Seal**

1. Remove flywheel. See Remove Flywheel task.
2. Pry rear oil seal (Figure 5, Item 3) from between flywheel housing (Figure 5, Item 1) and crankshaft hub (Figure 5, Item 2). Discard rear oil seal (Figure 5, Item 3).

**END OF TASK**

## Inspect Rear Crankshaft Oil Seal Mounting Surfaces



**Figure 5. Crankshaft Rear Oil Seal — Removal.**

### WARNING

Dry cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

1. Clean inside surface of flywheel housing (Figure 5, Item 1) and outer surface of crankshaft hub (Figure 5, Item 2) using dry cleaning solvent and wiping rags.
2. Remove burrs from inside surface of flywheel housing (Figure 5, Item 1) and outer surface of crankshaft hub (Figure 5, Item 2) using crocus cloth.

### END OF TASK

### Install Rear Crankshaft Oil Seal

1. Fill 40% to 60% of the cavity of the new rear oil seal (Figure 5, Item 3) with general purpose grease.
2. Position new rear oil seal (Figure 5, Item 3) to its mounting location between inside surface of flywheel housing (Figure 5, Item 1) and outer surface of crankshaft hub (Figure 5, Item 2), and install using crankshaft seal installer.
3. Install flywheel. See Install Flywheel task.

### END OF TASK

### END OF WORK PACKAGE

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL OIL PAN AND STRAINER**

---

**INITIAL SETUP:**

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)  
 Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB (WP 0179, Table 2, Item 39)

**Materials/Parts**

Pan, oil (WP 0152, Repair Parts List, Figure 47, Item 1)  
 Seal, oil ring (WP 0152, Figure 47, Item 5)  
 Tube, lube oil suction (WP 0152, Figure 47, Item 4)  
 Compound, sealing (WP 0180, Expendable and Durable Items List, Item 16)  
 Detergent, general purpose (WP 0180, Item 18)  
 Rag, wiping (WP 0180, Item 33)

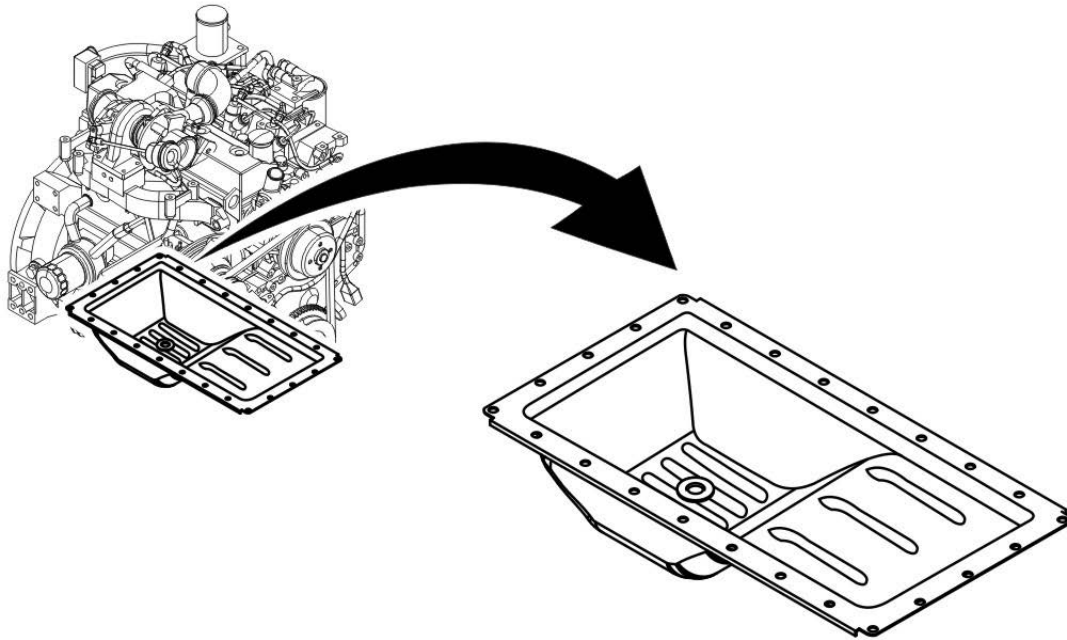
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**Personnel Required**

91D (1)

**Equipment Conditions**

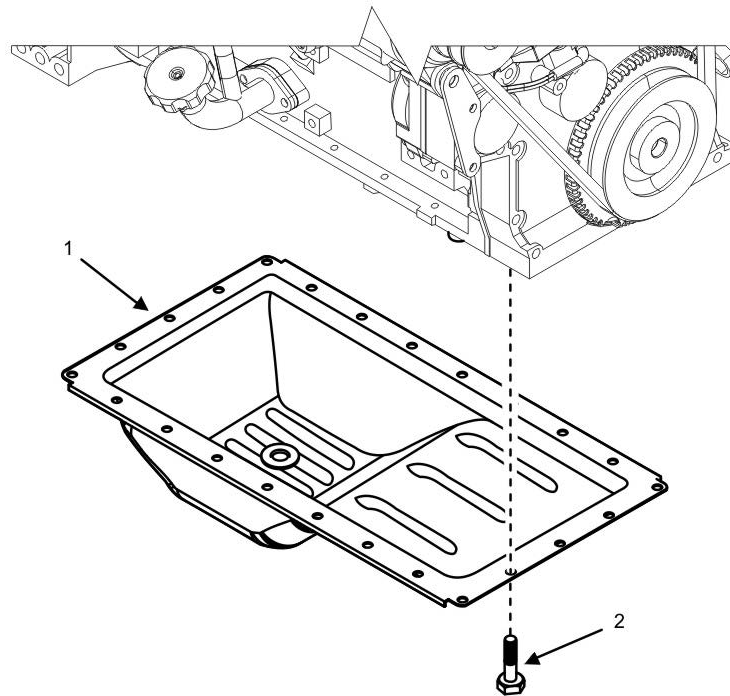
Engine control switch OFF (TM 9 6115-752-10, WP 0005)  
 Engine cool  
 Engine removed (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly)

**REMOVE/INSTALL OIL PAN AND OIL STRAINER****Remove Oil Pan and Strainer**

**Figure 1. Oil Pan — Location.**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate oil pan at bottom of engine assembly (Figure 1).





**Figure 2. Oil Pan — Removal.**

**NOTE**

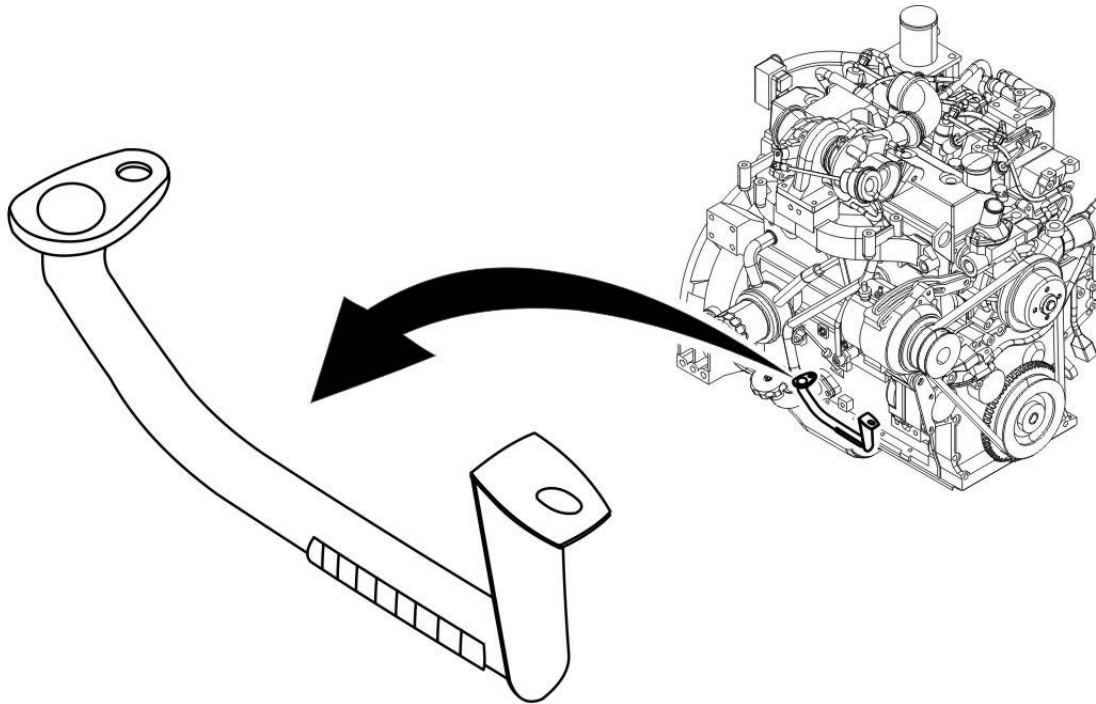
Figures are shown in proper orientation for clarity.

3. Rotate engine 180 degrees on stand to bring oil pan (Figure 1) to top for easier access.

**NOTE**

There is no gasket between oil pan and engine block. Oil pan is sealed using liquid gasket. Oil pan may need to be tapped slightly using a rubber mallet to loosen the seal of the liquid gasket material.

4. Remove 24 screws (Figure 2, Item 2) securing oil pan (Figure 2, Item 1) to engine.
5. Remove oil pan (Figure 2, Item 1) from engine.



**Figure 3. Oil Strainer Suction Tube — Location.**

6. Locate oil strainer suction tube at bottom of engine assembly (Figure 3).
7. Remove two mounting screws (Figure 4, Item 2) securing the oil suction tube (Figure 4, Item 3) to the engine block.
8. Remove the oil suction tube (Figure 4, Item 3) and O-ring (Figure 4, Item 1) from the engine block. Discard O-ring (Figure 4, Item 1).

#### **END OF TASK**

#### **Inspect Oil Pan and Strainer**

#### **CAUTION**

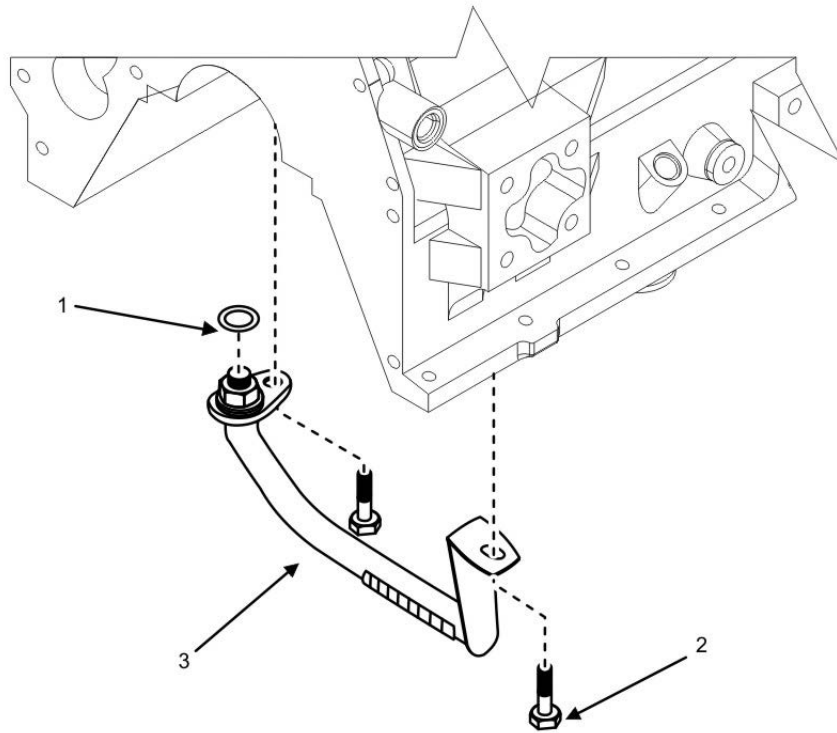
When scraping gasket material from engine block, use caution to keep gasket scrapings and other foreign material from entering the engine block. Place wiping rags inside engine block to prevent scrapings from entering internal engine components. Failure to comply may cause damage to equipment.

1. Scrape all gasket material from mating surfaces of oil pan (Figure 2, Item 1) and engine block.

#### **WARNING**

Water solution hot enough to clean engine parts is hot enough to cause scald injury to personnel. Be sure to wear protective clothing, gloves, and goggles while cleaning pistons. Failure to comply may cause injury or death to personnel.

2. Clean oil pan (Figure 2, Item 1) and oil strainer suction tube (Figure 4, Item 3) in a solution of detergent and hot water to remove residual oil.



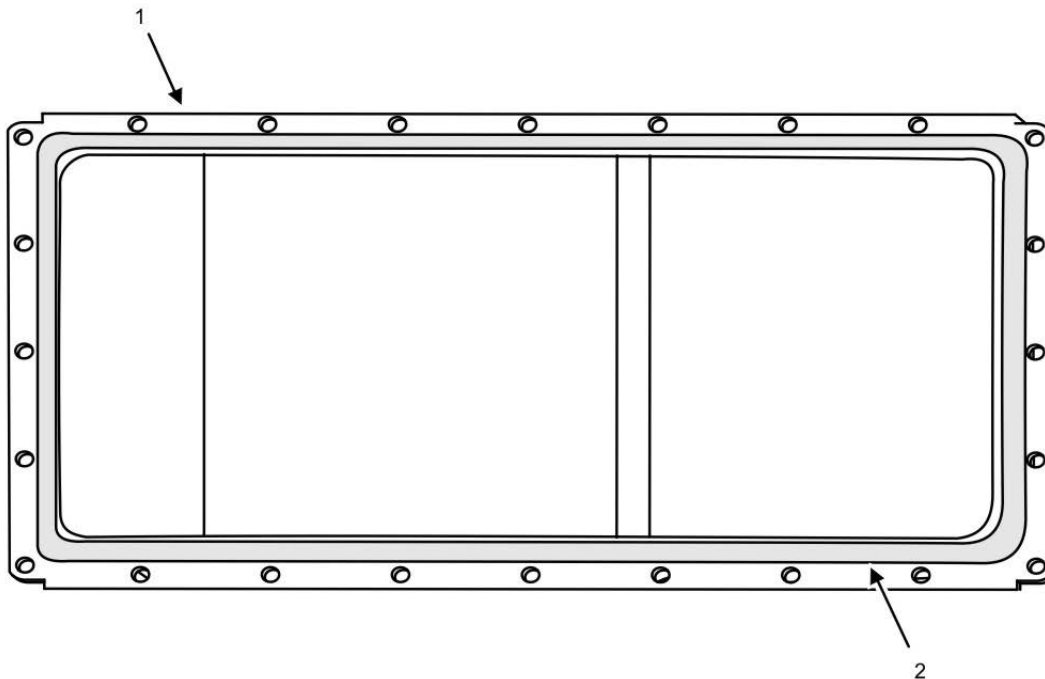
**Figure 4. Oil Suction Tube — Removal.**

3. Inspect oil pan (Figure 2, Item 1) for cracks, dents, and other damage.
4. Repair small dents in oil pan (Figure 2, Item 1) by tapping back into place with a hammer.
5. Replace oil pan (Figure 2, Item 1) if large dents that may affect capacity or cracks are present.
6. Inspect oil strainer suction tube (Figure 4, Item 3) for cracked or bent tube or broken screen.
7. Replace oil strainer suction tube (Figure 4, Item 3) if tube is cracked or bent or if screen is broken.

#### **END OF TASK**

#### **Install Oil Pan and Oil Strainer**

1. Apply a thin coat of clean engine oil to new oil strainer O-ring (Figure 4, Item 1).
2. Install O-ring (Figure 4, Item 1) to lubricating oil suction tube (Figure 4, Item 3) and lubricating oil suction tube (Figure 4, Item 3) onto engine block.
3. Install two screws (Figure 4, Item 2) to secure lubricating oil suction tube (Figure 4, Item 3) to the engine block.



**Figure 5. Liquid Gasket Application.**

**NOTE**

Wait approximately 20 min after gasket sealant has been applied before installing oil pan to engine block.

4. Apply a 5-mm thick bead of liquid gasket (Figure 5, Item 2) to flange of oil pan (Figure 5, Item 1).
5. Position oil pan (Figure 2, Item 1) to its mounting location on engine block and align the mounting holes.
6. Secure oil pan (Figure 2, Item 1) to engine block by installing 24 screws (Figure 2, Item 2) finger-tight.
7. Tighten oil pan screws (Figure 2, Item 2) at a torque value of 24 ft/lb (32 Nm) in a diagonal pattern to avoid warping and uneven tightening of oil pan (Figure 2, Item 1).

**NOTE**

Wait approximately 30 min before adding engine oil to oil pan.

8. Install engine assembly (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).
9. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
10. Start engine and check for proper operation (TM 9-6115-752-10).
11. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**TEST ENGINE OIL PRESSURE**

---

**INITIAL SETUP:****Test Equipment**

Test Set, Oil Systems Pressure (WP 0179, Table 2, Item 26)

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Lubricating oil, engine (WP 0180, Expendable and Durable Items List, Item 25)

Rags, wiping (WP 0180, Item 33)

Sealant (WP 0180, Item 34)

**Personnel Required**

91D (1)

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**References**

WP 0008, Electrical System Troubleshooting with a DCS Code

WP 0010, Engine System Troubleshooting with a DCS Code

WP 0011, Engine System Troubleshooting without a DCS Code

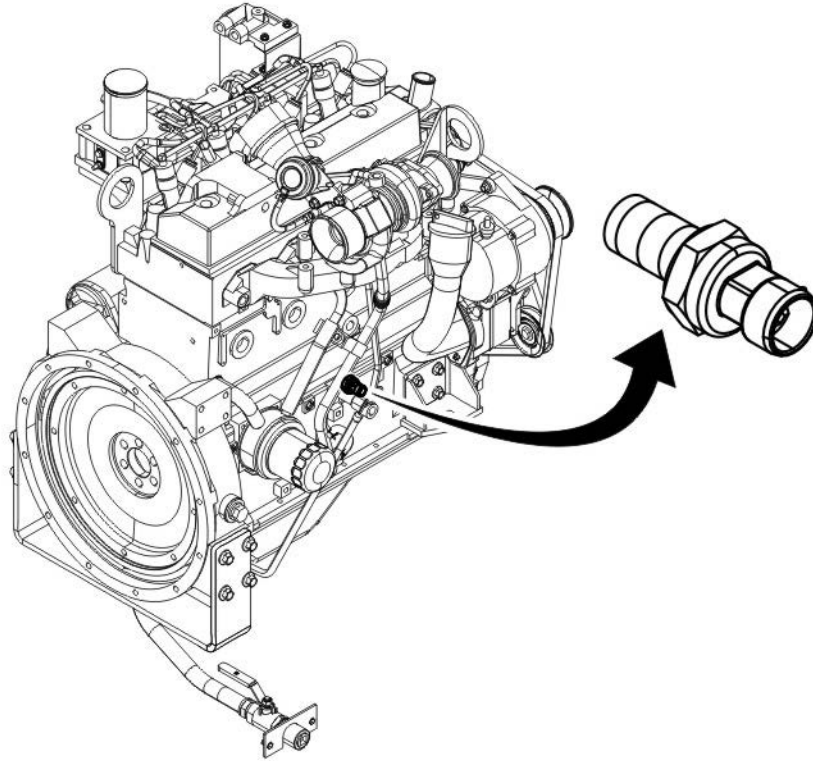
**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

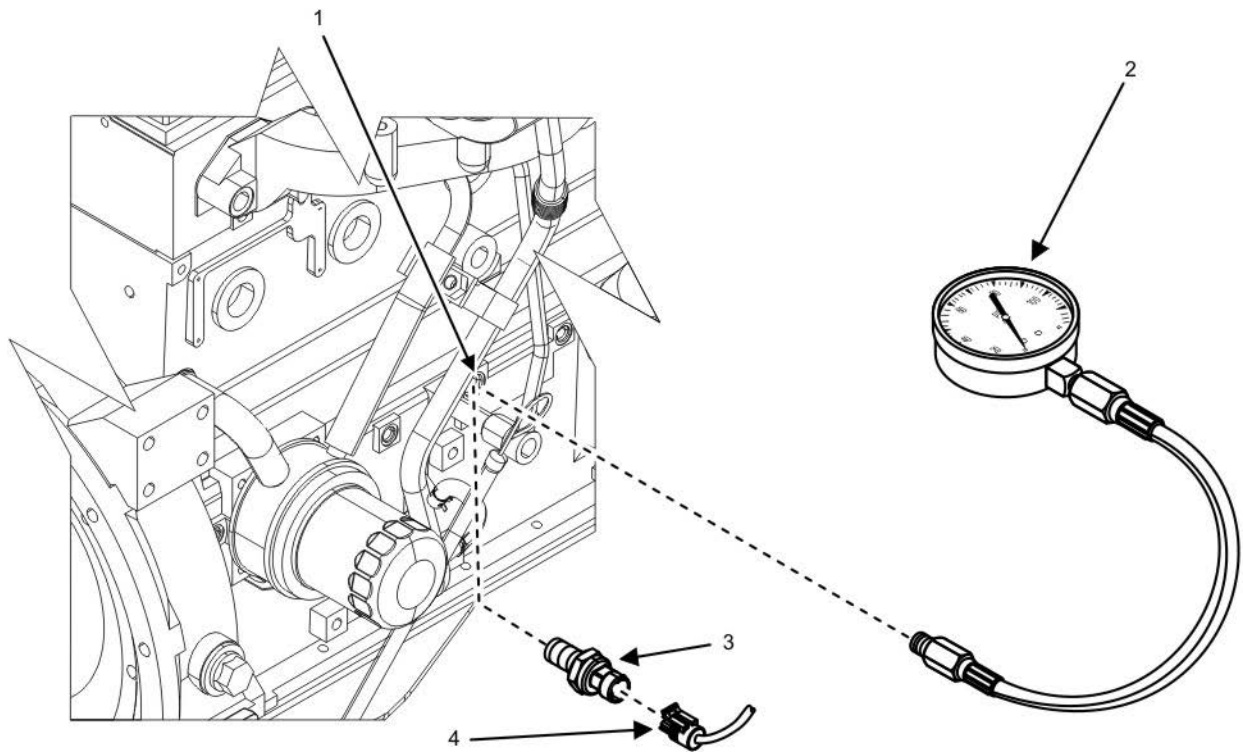
## TEST ENGINE OIL PRESSURE

### Test Engine Oil Pressure



**Figure 1. Engine Oil Pressure Sender — Location.**

1. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
2. Start engine and allow generator set to reach rated speed (TM 9-6115-752-10).
3. Record oil pressure value on DCS screen once generator set has reached rated speed (TM 9-6115-752-10).
4. Turn engine control switch to OFF(TM 9-6115-752-10).
5. Ensure equipment conditions are met in order presented in initial setup.
6. Open right-side door of generator set.
7. Locate oil pressure sender (Figure 1).



**Figure 2. Engine Oil Pressure — Test.**

8. Remove electrical connector (Figure 2, Item 4) from oil pressure sender (Figure 2, Item 3).
9. Place a wiping rag under oil pressure sender (Figure 2, Item 3) to catch any spilled engine oil.
10. Remove oil pressure sender (Figure 2, Item 3) from oil port (Figure 2, Item 1).
11. Apply pipe joint compound to threads of oil pressure gage assembly (Figure 2, Item 2).
12. Install oil pressure gage assembly (Figure 2, Item 2) into oil port (Figure 2, Item 1).

#### **NOTE**

[Warning 141: Oil Pressure Sensor Low] will display on DCS screen when oil pressure sender is disconnected from wiring. Proceed with test and reconnect wiring when finished.

13. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
14. Start engine and allow generator set to reach normal operating temperature (TM 9-6115-752-10).

#### **NOTE**

Minimum allowable oil pressure at rated engine speed is 35 psi (245 kPa). If oil pressure reading obtained from test is within specification but oil pressure sender has been providing a different reading to DCS, replace oil pressure sender.

15. Observe pressure reading on oil pressure gage assembly (Figure 2, Item 2).
  - a. Troubleshoot potential engine problems IAW low oil pressure faults if observed pressure is below 35 psi (245 kPa) (WP 0010, Engine System Troubleshooting with a DCS Code and WP 0011, Engine System Troubleshooting without a DCS Code).

- 
- b. Troubleshoot IAW DCS code 135 if results of test show oil pressure as correct and recorded DCS reading shows significant conflicting data (WP 0008, Electrical System Troubleshooting with a DCS Code).
  - c. Install existing oil pressure sender (Figure 2, Item 3) if oil pressure measurements are within specification and DCS readings are similar.
16. Turn off generator set and allow engine to cool (TM 9-6115-752-10).
  17. Remove oil pressure gage assembly (Figure 2, Item 2) from oil port (Figure 2, Item 1) on engine.
  18. Apply pipe joint compound to threads of oil pressure sender (Figure 2, Item 3) and install into oil port (Figure 2, Item 1).
  19. Install electrical connector (Figure 2, Item 4) to oil pressure sender (Figure 2, Item 3).
  20. Dispose of captured oil and soiled rags IAW local SOP.
  21. Close right-side door.
  22. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
  23. Start engine and check for leaks (TM 9-6115-752-10).
  24. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**LUBRICATION INSTRUCTIONS**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Antifreeze, ethylene glycol (WP 0180, Expendable and Durable Items List, Item 2)

Lubricating oil, engine (WP 0180, Item 25)

Lubricating oil, engine (WP 0180, Item 26)

Lubricating oil, engine (WP 0180, Item 27)

**Personnel Required**

91D (1)

**References**

A-A-52624A

MIL-A-53009A

MIL-PRF-2104H

MIL-PRF-46167D

TB 750-651

WP 0022, Service Cooling System

WP 0068, Service Lubrication System

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

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**LUBRICATION INSTRUCTIONS**

The AMMPS 30 kW generator set uses a variety of lubricating and cooling fluids. Refer to Table 1 for the fluids and their applications.

**WARNING**

When operating, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

**CAUTION**

Ensure the lubrication and cooling systems have been filled to capacity before operating the unit. Failure to comply may cause damage to equipment.

**Table 1. Lubrication Orders.**

USAGE	FLUID/LUBRICANT	CAPACITIES	EXPECTED TEMPERATURES
Engine oil	MIL-PRF-2104H <sup>a</sup> OE/HDO-15/40	Crankcase and engine 8.5 qt (8.0 L) with filter	+5°F to +135°F (-15°C to +57°C)
	MIL-PRF-2104H OE/HDO-10		-15°F to +5°F (-26°C to -15°C)
	MIL-PRF-46167D <sup>b</sup>		-50°F to +40°F (-45°C to +4°C)
Engine antifreeze	A-A-52624A <sup>c</sup>	Radiator and engine 12.8 qt (12.1 L)	-50°F to +135°F (-45°C to 57°C)
Hinge/latch lubrication	MIL-PRF-2104H OE/HDO-15/40	Not applicable	Not applicable

<sup>a</sup> Performance Specification, Lubrication Oil, Internal Combustion Engine, Combat/Tactical Service.

<sup>b</sup> Performance Specification, Lubrication Oil, Internal Combustion Engine, Arctic.

<sup>c</sup> Commercial Item Description: Antifreeze, Multi-engine Type.

### Change Engine Oil and Engine Oil Filter

See Table 2 and WP 0068, Service Lubrication System.

**Table 2. Table of Lubricants — Engine.**

SPECIFICATION	TYPE OF LUBRICANT	FREQUENCY	TEMPERATURE
MIL-PRF-2104H (OE/HDO-15/40)	Engine oil	750 hr or 6 months	+5°F to +135°F (-15°C to +57°C)
MIL-PRF-2104H (OE/HDO-10)			-15°F to +5°F (-26°C to -15°C)
MIL-PRF-46167D			-50°F to +40°F (-45°C to +4°C)

**END OF TASK**

## Change Engine Coolant

See Table 3 and WP 0022, Service Cooling System.

**Table 3. Table of Coolants — Engine.**

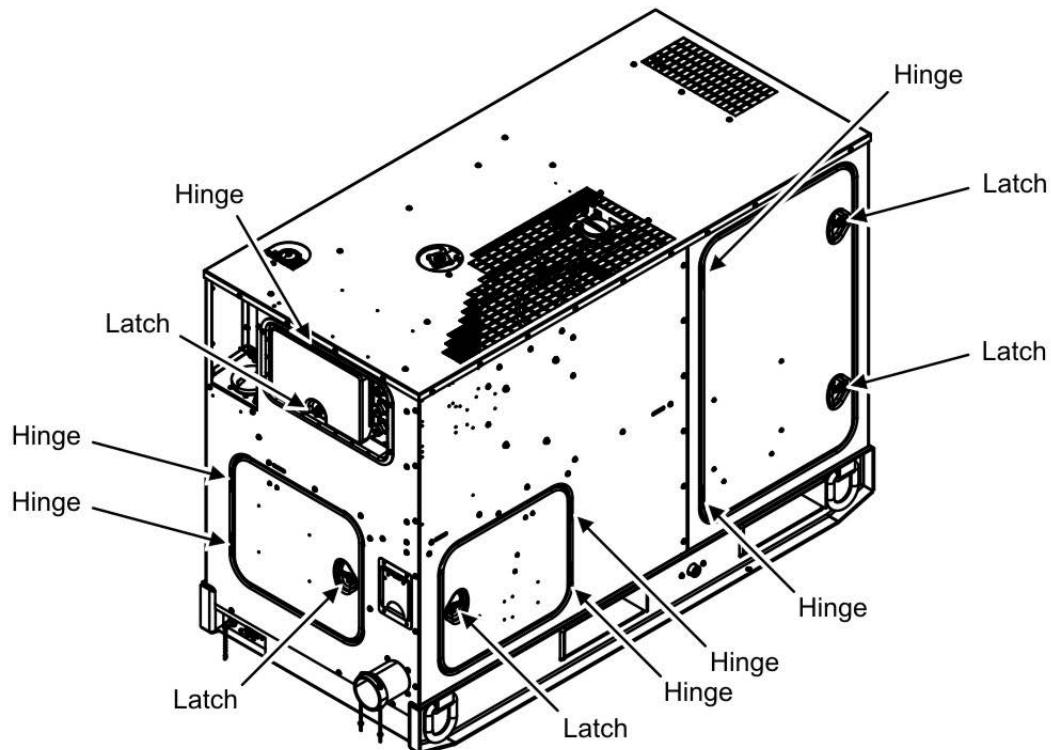
SPECIFICATION	TYPE OF LUBRICANT	FREQUENCY	TEMPERATURE
A-A-52624A	Antifreeze	2000 hr or 2 years	-50°F to +135°F (-45°C to +57°C)
MIL-A-53009A <sup>a</sup>	Liquid Cooling System Corrosion Inhibitor	See TB 750-651 <sup>b</sup>	+40°F to +135°F (+4°C to +57°C)

<sup>a</sup> Military Specification, Additive, Antifreeze Extender, Liquid Cooling Systems.

<sup>b</sup> Use of Antifreeze Solutions, Antifreeze Extender, Cleaning Compounds, and Test Kit in Engine Cooling Systems.

## END OF TASK

### Lubricate Hinges



**Figure 1. Hinge Locations — Rear and Right-Side.**

1. Open door (Figure 1 and Figure 2).
2. Apply one drop of lubrication oil (Table 4) to each hinge/latch.
3. Cycle door through three open-close sequences.

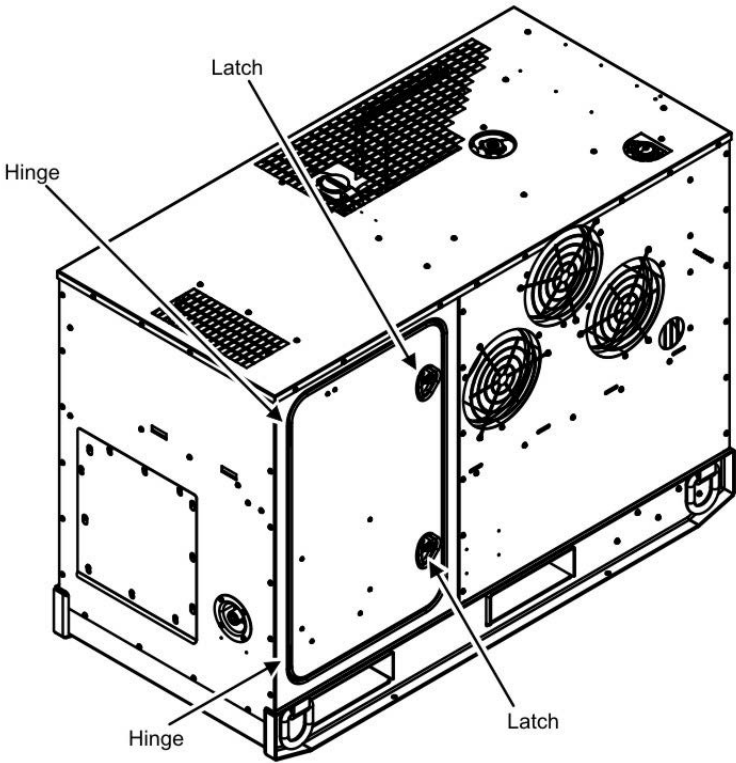


Figure 2. Hinge Locations — Front and Left-Side.

NOTE

Dispose of soiled rags IAW local SOP.

- 4. Wipe excess oil from hinge/latch.
- 5. Repeat steps 1 – 4 for each door.

Table 4. Table of Lubricant — Hinges.

SPECIFICATION	TYPE OF LUBRICANT	FREQUENCY	METHOD OF APPLICATION
MIL-PRF-2104H	MIL-PRF-2104H OE/HDO-15/40	500 hr	Oil can, mechanic's flexible

END OF TASK

END OF WORK PACKAGE

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**FIELD MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**TORQUE LIMITS**

---

**SCOPE**

This WP provides general torque limits for fasteners used on the 30 kW generator set. Special torque limits are indicated in Table 1. The Table 2 given in this WP shall be used when specific torque limits are not indicated in Table 1.

The following formula should be used to determine the setting used on the torque wrench when using a crowfoot extension: (SOCKET, CROWFOOT WRENCH HEAD 17105)  $M1 = M2 \times L1 / L2$ . The values from the formula are defined in the list below.

<u>Term</u>	<u>Definition</u>
M1	The torque setting of the wrench (this is what is being calculated).
M2	The desired torque to be applied to the nut.
L1	The normal length of the torque wrench (from center of grip to center of drive).
L2	The length of the torque wrench plus the length of crowfoot adapter (measured from the center of crowfoot drive to center of wrench drive).

The example shows the calculation of the torque to be set on an 18-in wrench with a 4-in crowfoot adapter to obtain 80 ft/lb of torque.

$$M1 (65.45) = 80 \times 18/22.$$

When any extension is 90 degrees from the torque wrench, no adjustment is necessary.

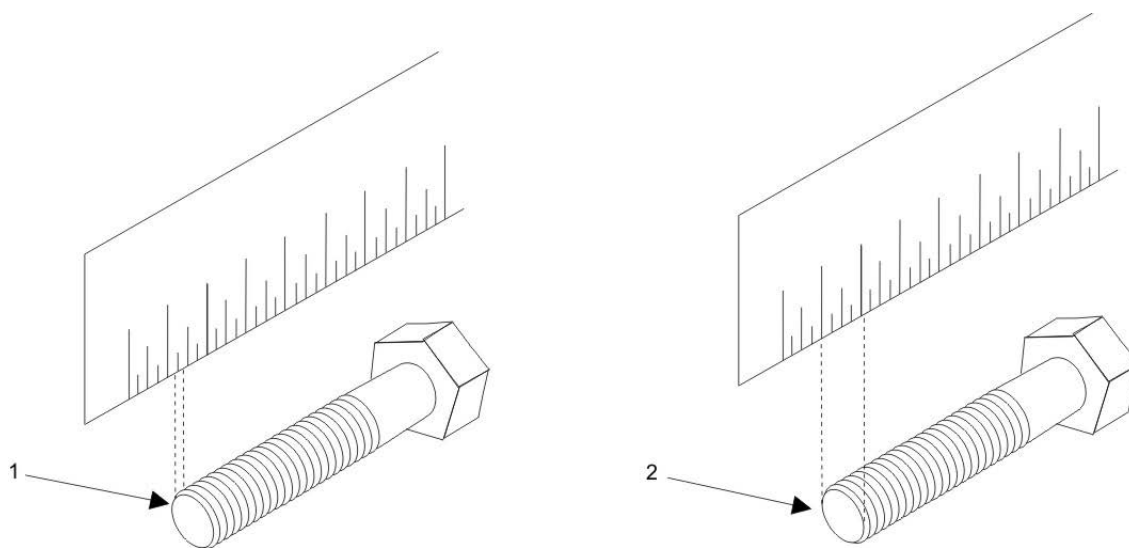
These general and special torque limits shall not be applied to fasteners that retain rubber components. The rubber components may be damaged before the correct torque limit is reached. If a special torque limit is not given in the maintenance instructions for rubber components, tighten the fastener until it touches the metal, and then tighten it one more turn.

Table 1. Special Torque Limits.

COMPONENT	THREAD DIAMETER AND PITCH	TORQUE	LUBRICATING OIL APPLICATION
Flywheel bolt	M10 – 1.25 mm	83.3 – 88.2 Nm 61 – 65 ft/lb	Applied
Positive Crankcase Ventilation (PCV) flange bolt	M8 – 1.5 mm	113 – 123 Nm 83 – 91 ft/lb	Not applied
Fuel injector bolt	M8 – 1.25 mm	24.2 – 28.4 Nm 18 – 21 ft/lb	Not applied
Fuel injector retainer bolt	Any	39.2 Nm 29 ft/lb	Not applied
Fuel pump drive gear nut	M14 – 1.5 mm	78 – 88 Nm 58 – 65 ft/lb	Not applied
High-pressure fuel lines bolt	M12 – 1.5 mm	29.4 – 34.3 Nm 22 – 25 ft/lb	Not applied
High-pressure fuel injector line nut	Any	29 – 34 Nm 22 – 25 ft/lb	Not applied
Fuel return line bolt	Any	7.8 – 9.8 Nm 69 – 87 in/lb	Not applied
Fuel injection pump mounting bolt	Any	23 – 28 Nm 17 – 21 ft/lb	Not applied
Fuel injector nozzle case nut	Any	39.2 – 44.1 Nm 30 – 33 ft/lb	Not applied
Fuel injection pump plunger plug	Any	30 – 35 Nm 22 – 26 ft/lb	Not applied

### How to Use Torque Table

1. Measure the diameter of the fastener (Figure 1, Item 2).
2. Look down the Tread Diameter And Pitch heading in Table 2 to find the diameter of the fastener.
3. Measure the distance between the thread ridges in millimeter to determine pitch (Figure 1, Item 1).
4. To locate torque value, match description and size of fastener in Table 2.



**Figure 1. Screw/Bolt Measurement.**

**CAUTION**

The torque values in Table 2 should be applied only to bolts marked "7" (7T strength). Failure to comply will cause damage to equipment.

**NOTE**

Apply 80% of listed torque value to fasteners tightened to aluminum alloys. Apply 60% of listed torque value to fasteners of 4T strength and all lock nuts.

**Table 2. Standard Torque Limits.**

ITEM	THREAD DIAMETER AND PITCH	TORQUE
Cap screw (7T) and nut	M6 – 1.0 mm	9.8 – 11.8 Nm 7 – 9 ft/lb
Cap screw (7T) and nut	M8 – 1.25 mm	22.6 – 28.4 Nm 17 – 21 ft/lb
Cap screw (7T) and nut	M10 – 1.5 mm	44.1 – 53.9 Nm 33 – 40 ft/lb
Cap screw (7T) and nut	M12 – 1.75 mm	78.4 – 98.0 Nm 58 – 72 ft/lb
Cap screw (7T) and nut	M14 – 1.5 mm	127.5 – 147.1 Nm 94 – 108 ft/lb
Cap screw (7T) and nut	M16 – 1.5 mm	215.7 – 235.4 Nm 159 – 174 ft/lb
PT Plug	0.125 mm – NA	9.8 Nm 7 ft/lb
PT plug	0.25 mm – NA	19.6 Nm 14 ft/lb
PT plug	0.375 mm – NA	29.4 Nm 22 ft/lb
PT plug	0.500 mm – NA	58.8 Nm 43 ft/lb
Pipe joint plug	M8 – NA	12.7 – 16.7 Nm 9 – 12 ft/lb
Pipe joint plug	M10 – NA	19 – 26 Nm 14 – 19 ft/lb
Pipe joint plug	M12 – NA	24.5 – 34.3 Nm 18 – 25 ft/lb
Pipe joint plug	M14 – NA	39.2 – 49.0 Nm 29 – 36 ft/lb
Pipe joint plug	M16 – NA	49.0 – 58.8 Nm 36 – 43 ft/lb

**END OF TASK****END OF WORK PACKAGE**



**CHAPTER 4**

**SUSTAINMENT MAINTENANCE TROUBLESHOOTING PROCEDURES**

**FOR**

**AMMPS 30KW GENERATOR SET**

CHAPTER 4

SUSTAINMENT MAINTENANCE TROUBLESHOOTING PROCEDURES

WORK PACKAGE INDEX

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<u>Title</u>	<u>WP Sequence No.</u>
SUSTAINMENT MAINTENANCE TROUBLESHOOTING INDEX.....	0096
SUSTAINMENT MAINTENANCE TROUBLESHOOTING PROCEDURES .....	0097

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**SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
SUSTAINMENT MAINTENANCE TROUBLESHOOTING INDEX**

---

**GENERAL TROUBLESHOOTING INFORMATION**

**NOTE**

Always perform sustainment maintenance PMCS prior to beginning any troubleshooting procedure (WP 0099, Sustainment PMCS).

Sustainment maintenance is responsible for repair and/or replacement of failed LRUs as identified by field maintenance. There are no specific troubleshooting procedures for sustainment maintenance. The malfunction/symptom index found below lists malfunction(s) identified at the field level and their related sustainment maintenance corrective action (by WP). If engine or AC generator overhaul is required, notify your supervisor.

**MALFUNCTION/SYMPTOM INDEX**

**Malfunction/Symptom**

**Troubleshooting Procedure WP and Page**

Generator set inoperable .....	WP 0097, Page 1
Failed LRU as determined by field maintenance.....	WP 0097, Page 1

**END OF WORK PACKAGE**



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**SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
SUSTAINMENT MAINTENANCE TROUBLESHOOTING PROCEDURES**

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**INITIAL SETUP:**

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 30)

**Personnel Required**

91D (1)

**References**

Chapter 3, Field Maintenance Instructions (Chapter 3 Index)

WP 0099, Sustainment PMCS

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**GENERATOR SET**

**NOTE**

Always perform PMCS prior to beginning any troubleshooting procedure (WP 0099, Sustainment PMCS).

**SYMPTOM**

Generator set inoperable.

**MALFUNCTION**

Failed LRU as determined by field maintenance.

**CORRECTIVE ACTION**

Repair/replace failed component(s) IAW maintenance procedures contained in Chapter 3, Field Maintenance Instructions. If symptom continues, notify your supervisor.

**END OF WORK PACKAGE**



**CHAPTER 5**

**SUSTAINMENT MAINTENANCE INSTRUCTIONS**

**FOR**

**AMMPS 30KW GENERATOR SET**

CHAPTER 5

SUSTAINMENT MAINTENANCE INSTRUCTIONS

WORK PACKAGE INDEX

<u>Title</u>	<u>WP Sequence No.</u>
SUSTAINMENT PMCS INTRODUCTION .....	0098
SUSTAINMENT PMCS .....	0099
GENERAL MAINTENANCE.....	0100
REMOVE/INSTALL HARMONIC BALANCER.....	0101
REMOVE/INSTALL GEAR CASE COVER .....	0102
REPLACE CYLINDER HEAD GASKET .....	0103
WIRING DIAGRAMS.....	0104



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**SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
SUSTAINMENT PMCS INTRODUCTION**

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**INTRODUCTION**

This section contains information required to perform sustainment maintenance PMCS. All PMCS for the AMMPS 30 kW generator set are completed by the operator (TM 9-6115-752-10) or by field maintenance personnel (WP 0016, Field PMCS). There are no PMCS tasks to be performed by sustainment maintenance personnel.

**END OF WORK PACKAGE**



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**SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
SUSTAINMENT PMCS**

---

**INITIAL SETUP:**

**References**

TM 9-6115-752-10

WP 0016, Field PMCS

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There are no PMCS tasks to be performed by sustainment maintenance personnel. All PMCS for the AMMPS 30 kW generator set are completed by the operator (TM 9-6115-752-10) or by field maintenance personnel (WP 0016, Field PMCS).

**END OF WORK PACKAGE**



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**SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**GENERAL MAINTENANCE**

---

**INITIAL SETUP:****Test Equipment**

Cable, Local Control (WP 0179, Table 2, Item 5)  
 Cable, Remote Control (WP 0179, Table 2, Item 6)  
 Test Set, Electronic Systems (WP 0179, Table 2, Item 25)  
 Tester, Antifreeze Solution (WP 0179, Table 2, Item 27)

**Tools and Special Tools**

Cable, Auxiliary With NATO Plug (WP 0179, Table 2, Item 3)  
 Crimping, Tool, Terminal (WP 0179, Table 2, Item 6)  
 Crimping, Tool, Terminal, Hand (WP 0179, Table 2, Item 7)  
 Hammer, Hand, Soft Face, Dead Blow (WP 0179, Table 2, Item 11)  
 Oiler, Hand (WP 0179, Table 2, Item 16)  
 Remover, Electrical Contact (WP 0179, Table 2, Item 20)  
 Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 30)  
 Tool, Rivet Nut (WP 0179, Table 2, Item 33)

**Materials/Parts**

Boot, dust and moisture (32) (WP 0170, Repair Parts List, Figure 65, Item 17)  
 Boot, dust and moisture seal (4) (WP 0170, Repair Parts List, Figure 65, Item 78)  
 Contact, electrical, 20-18 AWG (12) (WP 0170, Figure 65, Item 16)  
 Contact, electrical, 22-16 AWG (34) (WP 0170, Figure 65, Item 25)  
 Contact, electrical, 22-16 AWG (20) (WP 0170, Figure 65, Item 32)  
 Connector, plug, electrical (WP 0170, Figure 65, Item 4)  
 Connector, plug, electrical (WP 0170, Figure 65, Item 10)

**Materials/Parts**

Connector, plug, electrical (WP 0170, Figure 65, Item 13)  
 Contact, pin (5) (WP 0170, Figure 65, Item 40)  
 Contact, pin, 16-18 AWG (3) (WP 0170, Figure 65, Item 83)  
 Nut, plain, clinch (WP 0109, Repair Parts List, Figure 4, Item 4)  
 Plug, expansion (WP 0160, Repair Parts List, Figure 55, Item 5)  
 Rubber round section (2) (WP 0170, Figure 65, Item 64)  
 Seal (3) (WP 0170, Figure 65, Item 81)  
 Plug, protective, dust and moisture seal (2) (WP 0170, Figure 65, Item 54)  
 Seal, wire (WP 0170, Figure 65, Item 63)  
 Socket, terminal, 8 AWG (2) (WP 0171, Repair Parts List, Figure 66, Item 13)  
 Terminal, disconnect (4) (WP 0170, Figure 65, Item 29)  
 Terminal, disconnect (3) (WP 0170, Figure 65, Item 30)  
 Terminal, lug (5) (WP 0170, Figure 65, Item 8)  
 Terminal, lug (7) (WP 0170, Figure 65, Item 9)  
 Terminal, lug (3) (WP 0170, Figure 65, Item 42)  
 Terminal, lug, 16-20 AWG (2) (WP 0170, Figure 65, Item 55)  
 Terminal, lug, 5/16 16-14 AWG (1) (WP 0170, Figure 65, Item 84)  
 Terminal, lug, ring, M8, 5/16 IN (8) (WP 0171, Figure 66, Item 2)  
 Terminal, lug, ring, M12, 1/2 IN (3) (WP 0171, Figure 66, Item 4)  
 Terminal, lug, ring, 3/8 IN (1) (WP 0171, Figure 66, Item 9)

## INITIAL SETUP — CONTINUED:

### Materials/Parts

Terminal, quick disconnect, 18 – 16 AWG (3) (WP 0170, Figure 65, Item 59)

Terminal, quick disconnect, 20-16 AWG (24) (WP 0170, Figure 65, Item 70)

Terminal, quick disconnect, 20-16 AWG (20) (WP 0170, Figure 65, Item 71)

Terminal, socket (WP 0170, Figure 65, Item 62)

Terminal, spade, NO. 10, 16-14 AWG (WP 0170, Figure 65, Item 85)

Baking soda (WP 0180, Expendable and Durable Items List, Item 4)

Brush, wire, scratch, brass (WP 0180, Item 7)

Fuel, diesel (WP 0180, Item 20)

Fuel, diesel (WP 0180, Item 21)

Lubricating oil, engine (WP 0180, Item 28)

Rag, wiping (WP 0180, Item 33)

Tape, pressure sensitive (WP 0180, Item 38)

### Personnel Required

91D (1)

### References

A-A-52557A

MIL-DLT-83133G

WP 0009, Electrical System Troubleshooting without a DCS Code

WP 0016, Field PMCS

### References

WP 0017, Remove/Install DCS

WP 0018, Repair DCS

WP 0019, Remove/Install Air Intake Hose Assemblies

WP 0022, Service Cooling System

WP 0037, Remove/Install Batteries

WP 0044, Service Fuel System

WP 0045, Remove/Install Fuel Pump, Main/Auxiliary

WP 0046, Remove/Install Fuel Manifold

WP 0048, Replace Fuel Filter/Water Separator Element

WP 0068, Service Lubrication System

WP 0072, Remove/Install Spin-On Fuel Filter Assembly

WP 0094, Lubrication Instructions

### Equipment Conditions

Engine control switch OFF (TM 9-6115-752-10, WP 0005)

Engine cool

Battery ground cable removed (WP 0037, Remove/Install Batteries)

## GENERAL MAINTENANCE

This section provides general maintenance procedures for using a fire extinguisher, understanding general fuel requirements, using a multimeter, jump starting the generator set, cleaning battery terminals, repairing electrical connectors, accessing log files on DCS, using InPower AMMPS for troubleshooting and updating, and preparation for storage.

### Using a Fire Extinguisher

Do not use a fire extinguisher without reading the instructions and receiving proper training. When using a fire extinguisher, choose the proper type of fire extinguisher for the class of fire. Be sure to use a type “A” on ordinary materials (paper, cardboard, most plastics), type “B” on combustible or combustibles (diesel, gas, grease, and oil), type “C” on electrical fires, type “D” on combustible metal/chemical fires, or a multipurpose extinguisher designated with the proper letter for the class fire. For example, an “ABC” extinguisher will handle class “A,” “B,”

and "C" fires. Using the improper fire extinguisher can result in spreading of the fire and failure to extinguish. Failure to comply may cause injury or death to personnel. Do not attempt to extinguish a fire that is large in size. Do not attempt to extinguish a fire when there is no clear exit visible. Be sure building is evacuated. Call for help IAW local SOP. Stay low to avoid smoke. Failure to comply may cause injury or death to personnel.

1. Determine the class of fire ("A," "B," "C," or "D").
2. Choose the correct type of extinguisher.
3. Pull the pin of the extinguisher.
4. Aim the extinguisher at the base of the fire.
5. Sweep back and forth toward the fire.
6. Continue until fire is extinguished.
7. Recharge or dispose of extinguisher IAW local SOP.

## END OF TASK

### General Fuel Requirements

## WARNING

- Fuel is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash skin and change clothing promptly if in contact with fuel. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Ensure fuel source grounding strap is connected to unit fuel fill grounding stud (fuel fill static ground). When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate ESD. Fire and possible explosion can result. Failure to comply may cause injury or death to personnel.
- Fuels used in the generator set are combustible. Do not smoke or use open flames when performing maintenance. Fire and possible explosion may result. Failure to comply may cause injury or death to personnel and damage to equipment.
- Hot engine surfaces from the engine and generator circuitry are possible sources of ignition. When hot refueling with DF-1, DF-2, JP5, or JP8, avoid fuel splash and fuel spill. Do not smoke or use open flame when performing refueling. Remember PMCS is still required. Flames and possible explosion may result. Failure to comply may cause injury or death to personnel.

**NOTE**

DF-2 and JP8 are the types of fuel for the generator set. See Table 1.

**Table 1. Fuel.**

<b>AMBIENT TEMPERATURE</b>	<b>FUEL</b>
-50°F to +135°F (-45.6°C to 57.2°C)	MIL-DTL-83133G <sup>a</sup> JP8
+20°F to +135°F (-6.7°C to 57.2°C)	A-A-52557A <sup>b</sup> GR 2-D
-50°F to +135°F (-45.6°C to 57.2°C)	A-A-52557A GR 1-D

<sup>a</sup>Turbine Fuel, Aviation, Kerosene Type, JP-8 (NATO F-34), NATO F-35, and JP-8+100 (NATO F-37).

<sup>b</sup>Fuel Oil, Diesel; for Posts, Camps and Stations.

**END OF TASK****Using a Multimeter**

1. Select turn dial for option to be used:
  - a. Ohms for resistance, continuity, and short circuit.
  - b. Volts for voltage.
  - c. Amperes for current.

**WARNING**

High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.

**CAUTION**

Only use instruments known to be in good working order. When an instrument is used to measure resistance, proper function should be confirmed by touching metal tips of leads together and observing for minimum resistance indication. Failure to comply may cause damage to equipment.

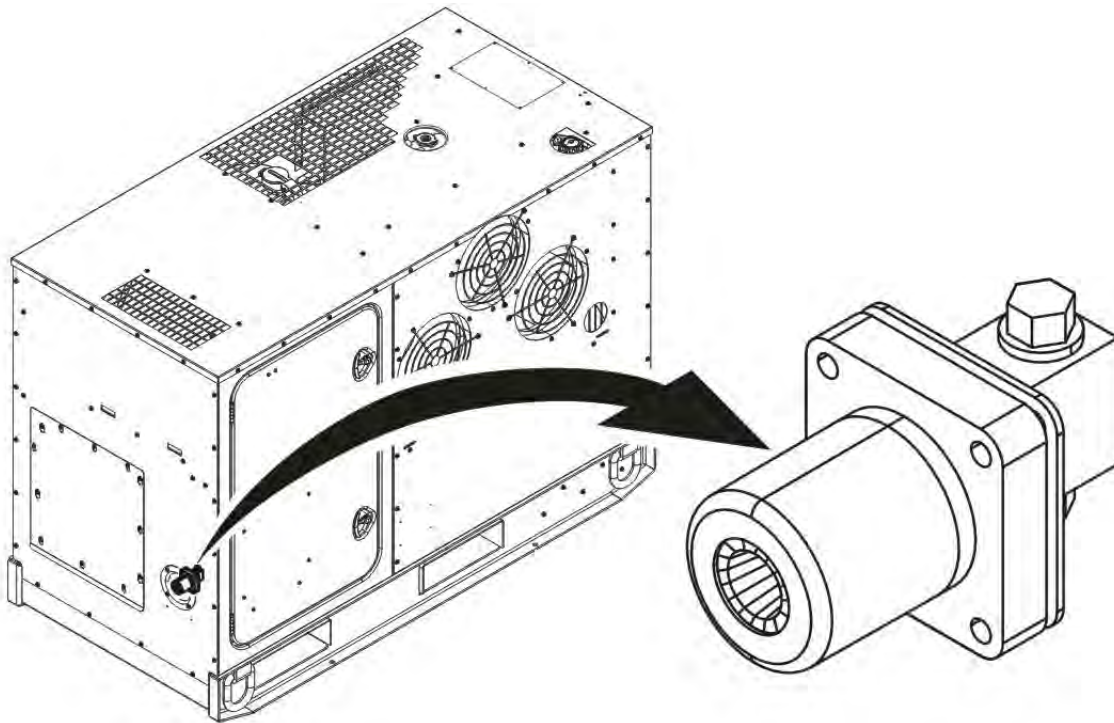
2. Measure resistance value.
  - a. Connect multimeter leads to leads of item being checked.
  - b. Use red lead for positive terminal.
  - c. Use black lead for negative terminal.
  - d. Observe display for reading.
  - e. Compare reading to specifications.
3. Check for opens or continuity.
  - a. Connect multimeter leads to wiring circuit being checked.
  - b. Observe display for reading.
  - c. Consult specifications for maximum permissible reading.



- 
4. Check for short circuit, wire to wire.
    - a. Connect multimeter leads to wires being checked.
    - b. Observe display for reading.
    - c. Reading must be greater than 100 kilohms (k $\Omega$ ) wire to wire or short exists.
  5. Check for short circuit to ground.
    - a. Connect one multimeter lead to wire being checked.
    - b. Touch multimeter probe to bare metal, such as engine block.
    - c. Observe display for reading.
    - d. Repeat steps 5 a through c for remaining wires in circuit.
    - e. Reading must be greater than 100 k $\Omega$  or short to ground exists.
  6. Place proper lead on proper terminal to check voltage:
    - a. Use red lead for positive terminal.
    - b. Use black lead for negative terminal.
    - c. Observe display for reading.
    - d. Compare reading to specifications.
  7. Place proper lead on proper terminal to check current:
    - a. Use red lead for positive terminal.
    - b. Use black lead for negative terminal.
    - c. Observe display for reading.
    - d. Compare reading to specifications.

**END OF TASK****Jump-Starting the Generator Set**

Jump-starting requires the use of the NATO slave receptacle. NATO slave cables are required to jump-start a 24-V system. The generator set cannot be jump-started with a 12-V system. Ensure the vehicle/equipment being used to jump-start the generator set is a 24-V system.



**Figure 1. NATO Slave Receptacle — Location.**

### **WARNING**

- NATO slave receptacle is electrically live at all times and is not protected by a fuse. Disconnecting main DC circuit breaker does not ensure the circuit is dead. This circuit is only dead when the batteries are fully disconnected. Disconnect both batteries before performing maintenance on the slave receptacle. Failure to comply may cause injury or death to personnel.
- Ensure equipment/vehicles being used to jump-start the generator set are not touching. Touching of metal surfaces can cause improper grounding. Do not allow the cable ends to touch each other or any part of the generator set/vehicle/equipment other than the NATO slave receptacle. May result in damage to the electrical system of the generator set/vehicle/equipment. Failure to comply may cause injury or death to personnel.
- High voltage is produced when generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Do not ground yourself in standing water. Never attempt to connect or disconnect load cables while the generator set is running. Failure to comply may cause injury or death to personnel.

1. Move the vehicle/equipment being used to jump-start close enough to the generator set that the cables reach.
2. Ensure the engine control switch on the generator set is OFF (TM 9-6115-752-10).
3. Ensure the vehicle/equipment being used to jump-start is OFF.
4. Locate the NATO slave receptacle inside the left side door (Figure 1).
5. Remove the NATO slave receptacle cover.
6. Ensure NATO slave cable ends are free of dirt and debris.
7. Ensure NATO slave receptacles are free of dirt and debris.

8. Connect the NATO slave cable to the generator set.
9. Turn on the vehicle/equipment being used to jump start the generator set.
10. Connect the other end of the NATO slave cable to the vehicle/equipment being used to jump-start.
11. Allow the generator set to charge for 10 min.

### CAUTION

Do not crank engine in excess of 15 sec. Allow starter to cool for at least 15 sec between attempted starts. Failure to comply may cause damage to equipment.

12. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
13. Start engine and check for proper operation (TM 9-6115-752-10).
14. Ensure proper operation of the generator set.
15. Remove the NATO slave cable from the vehicle/equipment being used to jump start.
16. Remove the NATO slave cable from the generator set.
17. Replace the cap on the NATO slave receptacle.

### END OF TASK

#### Clean Battery Posts

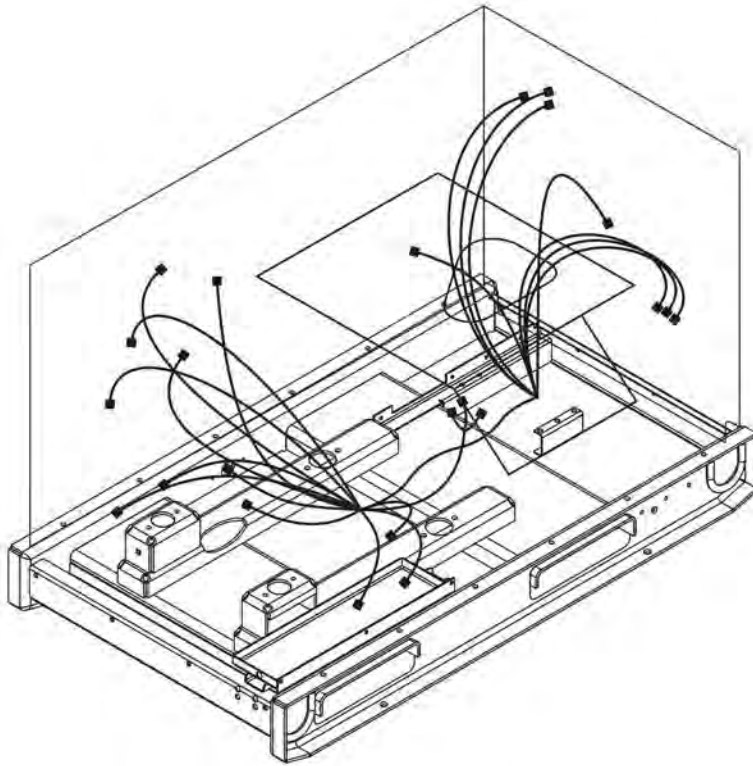
### WARNING

- High voltage is produced when this generator set is in operation. Ensure engine control and DEAD CRANK switches are set to OFF, negative battery cable is disconnected, and unit is completely shut down and free of any power source before attempting any troubleshooting or maintenance on unit. Failure to comply may cause injury or death to personnel.
  - The right-hand battery negative lead that connects directly to the grounding stud must be disconnected prior to disconnecting or removing batteries. Follow procedural steps in exact order given for removal and installation. Failure to comply may cause injury or death to personnel.
  - Shut down generator sets before performing inspection of load cables. Failure to comply may cause injury or death to personnel by electrocution.
  - Batteries give off combustible gas. Do not smoke or use open flame when performing maintenance. Failure to comply may cause injury or death to personnel and damage to equipment.
  - Battery acid can cause burns to skin and cause eye injury. Wear safety goggles and chemical gloves and avoid acid splash while working on the batteries. Failure to comply may cause injury or death to personnel.
  - Lifting batteries may cause back strain. Ensure proper lifting techniques are used when lifting batteries. Failure to comply may cause injury or death to personnel.
1. Remove battery cables from battery terminals (WP 0037, Remove/Install Batteries).
  2. Apply a one-part sodium bicarbonate to two-parts water solution to terminals.
  3. Let terminals stand in solution for 2 – 3 min.
  4. Clean terminals with a wire brush.

5. Dry battery terminals with a wiping rag.
6. Install battery cables to battery terminals (WP 0037, Remove/Install Batteries).

## END OF TASK

### Repair Electrical Connectors



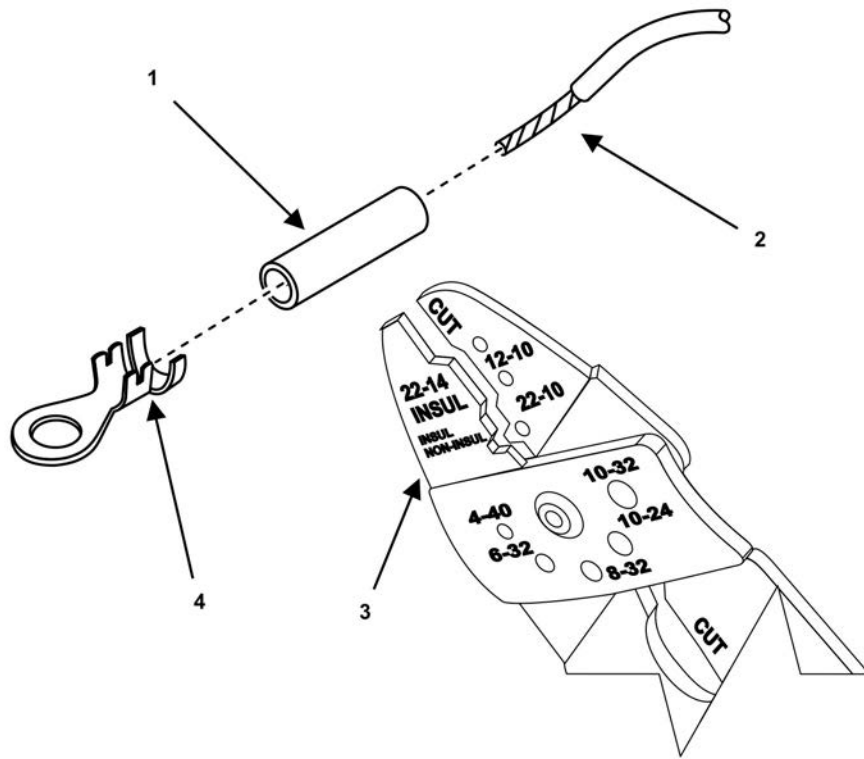
**Figure 2. Wiring Harness — Location.**

## NOTE

Several types of connector are used on the AMMPS generator set wiring harness. Each type of electrical connector can be replaced without removing the entire wiring harness from the unit. Replacement steps for each type of electrical connector are given below. A table at the end of each repair step identifies the relevant electrical connector, contact type, and number of contacts required for each component connector type.

See the fold-out electrical wiring diagrams in the rear of this manual for locations of the various types of electrical connectors. Electrical connector numbers in the tables are keyed to the Engine Harness fold out diagram at the back of this manual.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Locate electrical connector or wiring harness (Figure 2) that requires repair.
3. Replace simple crimp-on ring connector (Table 2).

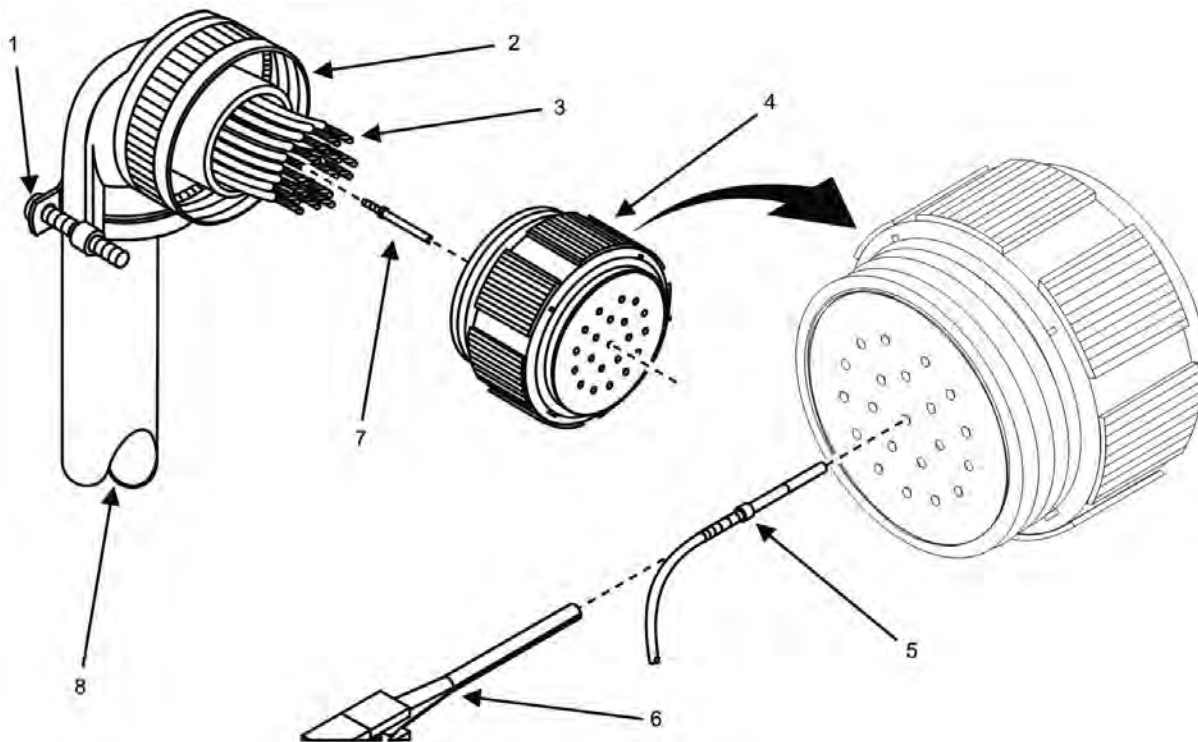


**Figure 3. Simple Crimp-on Ring Connector.**

- a. Identify failed electrical component connector (Figure 3, Item 4).
- b. Cut and discard old connector (Figure 3, Item 4) from wire lead (Figure 3, Item 2) at base of old connector.
- c. Install a length of new shrink wrap (Figure 3, Item 1) long enough to cover the crimp area of new connector (Figure 3, Item 4) onto wire lead (Figure 3, Item 2).
- d. Strip insulation from wire lead (Figure 3, Item 2) equal to depth of new connector well.
- e. Place bare wire of wire lead (Figure 3, Item 2) into new connector (Figure 3, Item 4) well and crimp to secure connector (Figure 3, Item 4) to wire lead (Figure 3, Item 2) using a crimping tool (Figure 3, Item 3).
- f. Test new connector (Figure 3, Item 4) using a multimeter to verify continuity is present using wire diagram as a guide to identify the correct circuit.
- g. Slide shrink wrap (Figure 3, Item 1) over newly crimped connection and heat to form a tight seal.
- h. Install new connector (Figure 3, Item 4) to electrical component.
- i. Check operation of electrical component for proper operation. Repair as required.

**Table 2. Crimp-on Ring Connector Repair.**

WIRING HARNESS	ELECTRICAL COMPONENT	CONNECTOR TYPE	NO. CONTACTS
Engine wiring harness	DEAD CRANK SWITCH	Ring	3
Engine wiring harness	Starter relay	Spade	1
Engine wiring harness	Intake air heater relay (control)	Ring	2
Engine wiring harness	CB502 (UOC 98M only)	Ring	3
Power wiring harness	Intake air heater	Ring	1
Power wiring harness	Battery-charging alternator (B+)	Ring	1
Power wiring harness	Battery-charging alternator (Ground)	Ring	1
Power wiring harness	Intake air heater relay	Ring	2
Power wiring harness	Starter	Ring	3
Power wiring harness	Main DC Circuit Breaker	Ring	4

**Figure 4. Multipin Connector Repair.**

4. Repair multipin bulkhead-mounted connector (Table 3).

### NOTE

This task contains typical repair instructions for the multipin connectors used on the 30 kW AMMPS DCS. There are three different connectors used on the generator set. Each one varies in the number of pins/sockets used in the connector. Repair of each connector uses the same procedure provided below. See Table 3 for the correct connector for your application.

- Disconnect cable connector from generator set component.
- Test wire/socket connections (Figure 4, Item 5) of electrical connector using a multimeter to determine failed socket(s) (Figure 4, Item 7) within the connector.
- Loosen two screws (Figure 4, Item 1) that secure strap of shell (Figure 4, Item 2) to cable (Figure 4, Item 8).

- d. Unscrew shell (Figure 4, Item 2) from connector housing (Figure 4, Item 4).
- e. Slide shell (Figure 4, Item 2) down cable (Figure 4, Item 8) to access back of connector housing (Figure 4, Item 4).
- f. Remove every wire/socket connection (Figure 4, Item 5) from rear of connector housing (Figure 4, Item 4) using extractor tool (Figure 4, Item 6).
- g. Inspect all individual wire/socket connections for signs of obvious damage. Replace all damaged sockets (Figure 4, Item 7) while accessible
- h. Inspect cable (Figure 4, Item 8), shell (Figure 4, Item 2), and connector housing (Figure 4, Item 4) for signs of obvious damage. Replace all damaged components as required.

### CAUTION

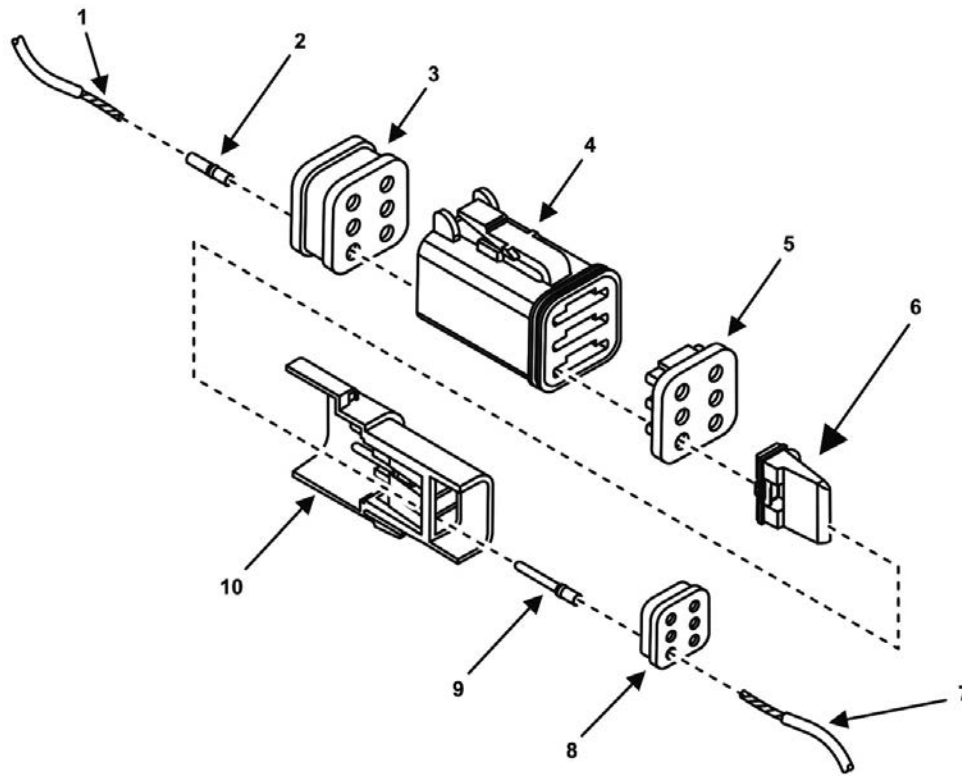
De-solder (see TB SIG 222) broken/damaged socket(s) (Figure 4, Item 7) and remove socket (Figure 4, Item 7) from cable wire (Figure 4, Item 3).

- i. Solder (see TB SIG 222) new socket(s) (Figure 4, Item 7) to cable wire (Figure 4, Item 3).
- j. Test new socket/wire connection(s) (Figure 4, Item 5) to ensure proper electrical flow.
- k. Insert all individual socket/wire connections (Figure 4, Item 5) into rear of connector housing (Figure 4, Item 4) using tags/markings applied during removal as a guide. Push socket/wire connections (Figure 4, Item 5) into connector housing (Figure 4, Item 4) locations by hand until each socket (Figure 4, Item 7) is fully seated and will not pull out.
- l. Slide shell (Figure 4, Item 2) over cable (Figure 4, Item 8) to its mounting location on connector housing (Figure 4, Item 4) and secure by screwing shell (Figure 4, Item 2) onto connector housing (Figure 4, Item 4).
- m. Tighten two screws (Figure 4, Item 1) to secure strap of shell (Figure 4, Item 2) to cable (Figure 4, Item 8) and relieve strain on cable (Figure 4, Item 8).

**Table 3. Multipin Bulkhead-Mounted Connector Repair.**

<b>ELECTRICAL COMPONENT (CONNECTOR NUMBER)</b>	<b>CONTACT TYPE</b>	<b>NO. CONTACTS</b>
DCS (P1)	Socket	21
DCS (P2)	Socket	29
DCS (P3)	Socket	61

5. Repair square type connector (Table 4).



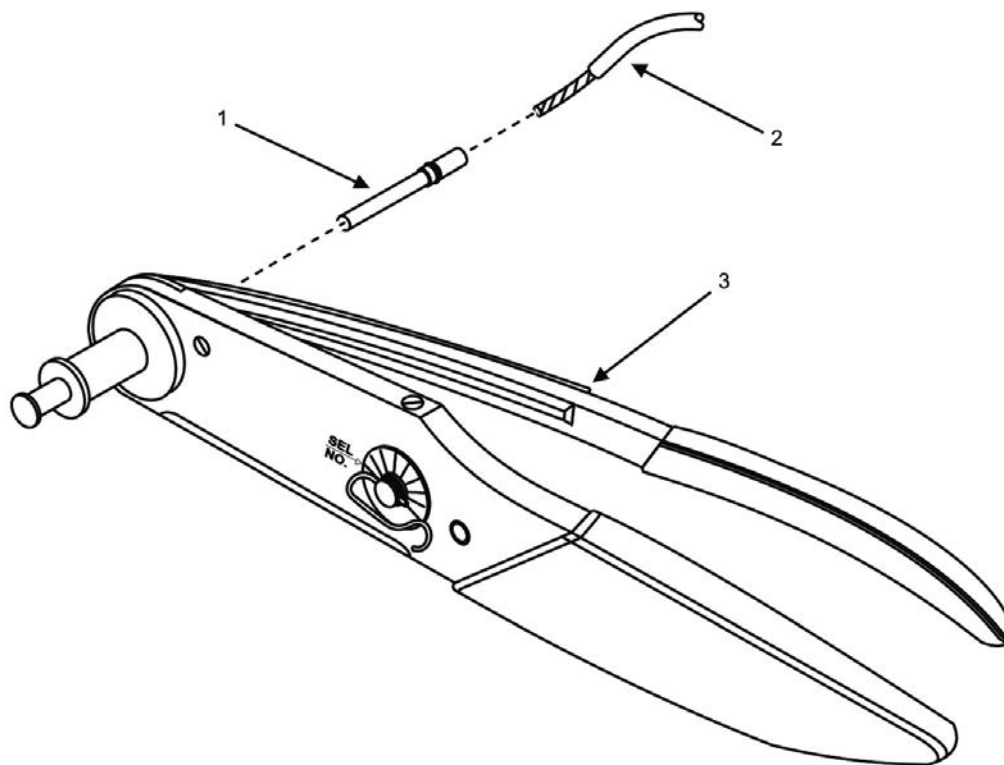
**Figure 5. Square-Type Connector.**

### NOTE

Electrical connectors covered by this method may vary in design/shape, but the procedure to repair them is the same.

- a. Identify electrical connector (Figure 5, Items 4 and 10) containing failed contact (Figure 5, Items 2 and 9).
- b. Disconnect connector (Figure 5, Items 4 and 10) from electrical component (Table 4).
- c. Test contact (Figure 5, Items 2 and 9) of electrical connector (Figure 5, Items 4 and 10) using a multimeter to determine failed contact (Figure 5, Items 2 and 9) within the connector (Figure 5, Items 4 and 10).
- d. Remove wedge lock (Figure 5, Item 6) or retainer lock (Figure 5, Item 5) from connector (Figure 5, Items 4 and 10) by pulling straight out using needle nose pliers.
- e. Remove failed contact (Figure 5, Item 2 and 9) by gently pulling wire (Figure 5, Items 1 and 7) attached to failed contact (Figure 5, Item 2 and 9) from connector (Figure 5, Items 4 and 10) while, at the same time, releasing the locking finger of failed contact (Figure 5, Items 4 and 10) using the proper contact removal tool.
- f. Hold seal (Figure 5, Items 3 and 8) in place using the removal tool as it may be displaced when pulling failed contact (Figure 5, Items 2 and 9) from rear of connector (Figure 5, Items 4 and 10) once failed contact (Figure 5, Items 2 and 9) is free from its locking finger.
- g. Cut failed contact (Figure 5, Items 2 and 9) from wire lead (Figure 5, Items 1 and 7) at base of failed contact (Figure 5, Items 2 and 9). Discard failed contact (Figure 5, Items 2 and 9).





**Figure 6. Square-Type Crimping Tool.**

- h. Strip insulation from wire lead (Figure 5, Items 1 and 7) to the length of new contact (Figure 5, Items 2 and 9) wire well.

### NOTE

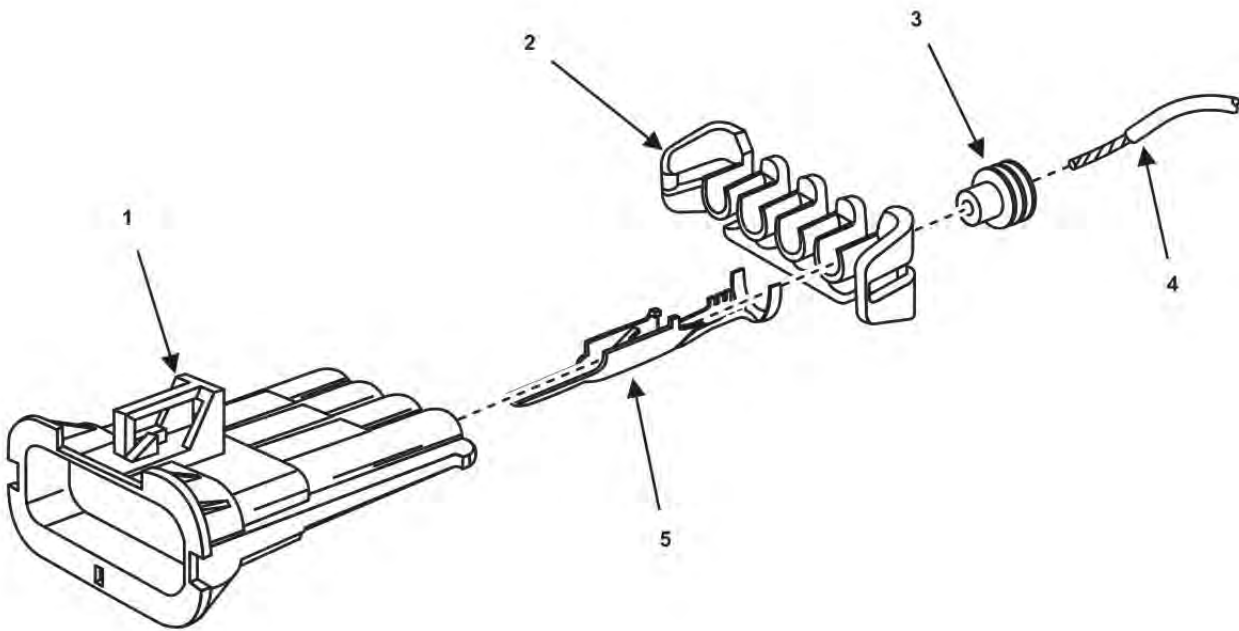
Crimping tool must be readjusted for each type/size of contact.

- i. Adjust crimping tool (Figure 6, Item 3) to the correct size of new contact (Figure 6, Item 1).
- j. Insert new contact (Figure 6, Item 1) into crimping tool (Figure 6, Item 3).
- k. Insert wire (Figure 6, Item 2) into contact (Figure 6, Item 1). Ensure all strands of wire are inside contact barrel. Contact (Figure 6, Item 1) must be centered between indicators of crimping tool (Figure 6, Item 3).
- l. Close handles of crimping tool (Figure 6, Item 3) until crimp cycle is completed.
- m. Release crimping tool handles and remove crimped contact (Figure 6, Item 1) from tool crimping tool (Figure 6, Item 3).
- n. Inspect crimped contact (Figure 6, Item 1) to ensure all strands of wire lead are inside contact barrel.
- o. Repeat substeps 5 i through n if all wire strands were not captured inside contact (Figure 6, Item 1).
- p. Grasp wire lead (Figure 5, Items 1 and 7) approximately 1.0 in (25 mm) behind new contact (Figure 5, Items 2 and 9).
- q. Insert new contact (Figure 5, Items 2 and 9) straight into rear of seal (Figure 5, Items 3 and 8) until a click is felt.
- r. Pull gently on wire lead (Figure 5, Items 1 and 7) to verify contact (Figure 5, Items 2 and 9) is locked into connector (Figure 5, Items 4 and 10).

- s. Install wedge lock (Figure 5, Item 6) or retainer lock (Figure 5, Item 5) into connector (Figure 5, Items 4 and 10).
- t. Install repaired connector (Figure 5, Items 4 and 10) to electrical component.
- u. Check electrical component for proper operation. Repair as required.

**Table 4. Square-Type Connector Repair.**

ELECTRICAL COMPONENT (CONNECTOR NUMBER)	CONTACT TYPE	NO. CONTACTS
Winterization kit (J20C)	Socket	3
Main fuel pump (P65)	Socket	2
Auxiliary fuel pump (P60)	Socket	2
G1 field (P90)	Socket	2
Fuel level sensor (P70)	Socket	3
Spares (P75)	Socket	6
G1 quad (P85) (UOC 98L only)	Socket	2
Output box — P500	Socket	37
Battery-charging alternator	Socket	1

**Figure 7. Flat-type Pin Connector.**

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**NOTE**

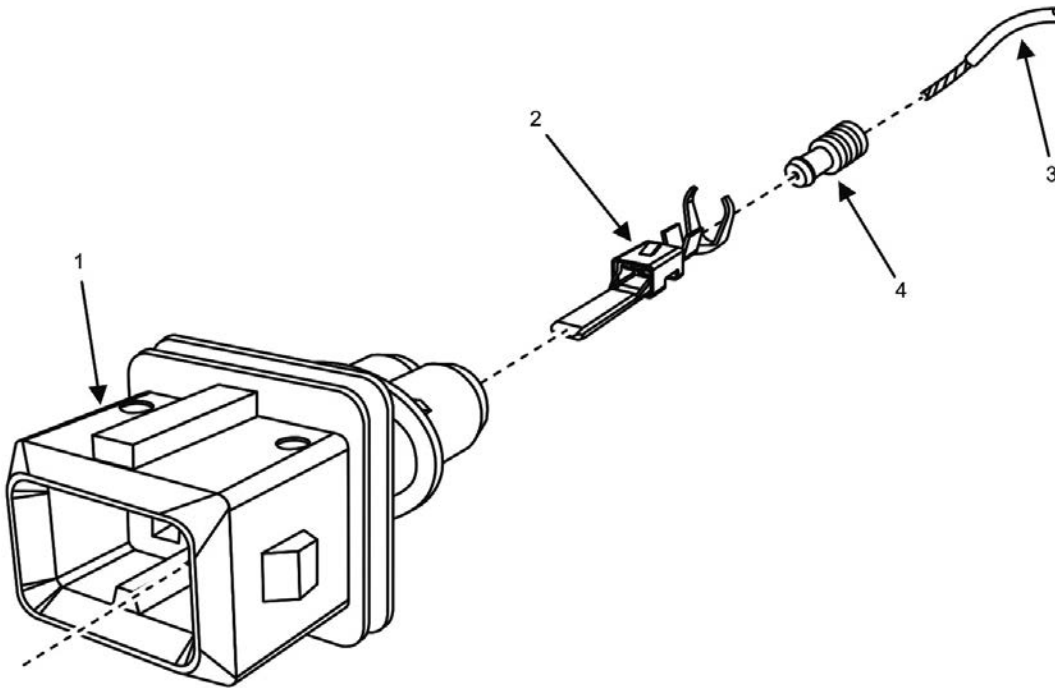
The flat-type electrical connectors used on the AMMPS 30 kW generator set wiring harness are all of the pin type. The mating connectors are integral parts of the electrical components to which they are attached. The female type connectors attached to various electrical components are not repairable and therefore not depicted.

6. Repair flat-type connector (Table 5).
  - a. Identify electrical connector containing failed contact.
  - b. Disconnect wiring harness from electrical component.
  - c. Test contacts (Figure 7, Item 5) of electrical connector using a multimeter to determine failed contact within the connector.
  - d. Pull connector lock (Figure 7, Item 2) from rear of electrical connector shell (Figure 7, Item 1).
  - e. Remove failed contact (Figure 7, Item 5) by gently pulling wire lead (Figure 7, Item 4) attached to failed contact (Figure 7, Item 5) from rear of connector shell (Figure 7, Item 1) while, at the same time, releasing contact (Figure 7, Item 5) from front of connector shell (Figure 7, Item 1) using the proper contact removal tool.
  - f. Remove and discard failed contact (Figure 7, Item 5) from wire lead (Figure 7, Item 4).
  - g. Remove and discard seal (Figure 7, Item 3) from wire lead (Figure 7, Item 4).
  - h. Strip insulation from wire lead (Figure 7, Item 4) to the length of new contact wire well.
  - i. Install new seal (Figure 7, Item 3) onto wire lead (Figure 7, Item 4).
  - j. Crimp new contact (Figure 7, Item 5) to wire lead (Figure 7, Item 4) using proper crimping tool.
  - k. Test new contact (Figure 7, Item 5) using a multimeter to verify continuity is present using wire diagram as a guide to identify the correct circuit.
  - l. Grasp wire lead (Figure 7, Item 4) approximately 1.0 in (25 mm) behind new contact (Figure 7, Item 5).
  - m. Insert new contact (Figure 7, Item 5) straight into rear of connector shell (Figure 7, Item 1) until a click is felt.
  - n. Pull gently on wire lead (Figure 7, Item 4) to verify contact (Figure 7, Item 5) is locked into connector shell (Figure 7, Item 1).
  - o. Install connector lock (Figure 7, Item 2) into rear of connector shell (Figure 7, Item 1).
  - p. Install seal (Figure 7, Item 3) into connector lock (Figure 7, Item 2) until outer surface of seal (Figure 7, Item 3) is flush with outer surface of connector lock (Figure 7, Item 2).
  - q. Install repaired connector (Figure 7, Item 1) to electrical component.
  - r. Check electrical component for proper operation. Repair as required.

**Table 5. Flat-Type Connector Repair.**

WIRING HARNESS	ELECTRICAL COMPONENT (#)	CONTACT TYPE	NO. CONTACTS
Engine wiring harness	Battery sensor (P5)	Pin	3
Engine wiring harness	Oil pressure sensor (P40)	Pin	3
Engine wiring harness	Cooling fan (P94 through P99)	Pin	12
Engine wiring harness	Relay panel (P5A) (black)	Pin	6
Engine wiring harness	Relay panel (P5B) (grey)	Pin	6
Engine wiring harness	Relay panel (P5C) (blue)	Pin	7
Engine wiring harness	Relay panel (P5D) (green) (UOC 98L)	Pin	7
Engine wiring harness	Relay panel (P5D) (green) (UOC 98M)	Pin	3
Power wiring harness	Relay panel (P11) (black)	Pin	1
Power wiring harness	Relay panel (P10) (grey)	Pin	1

7. Repair winterization kit connector (Table 6).

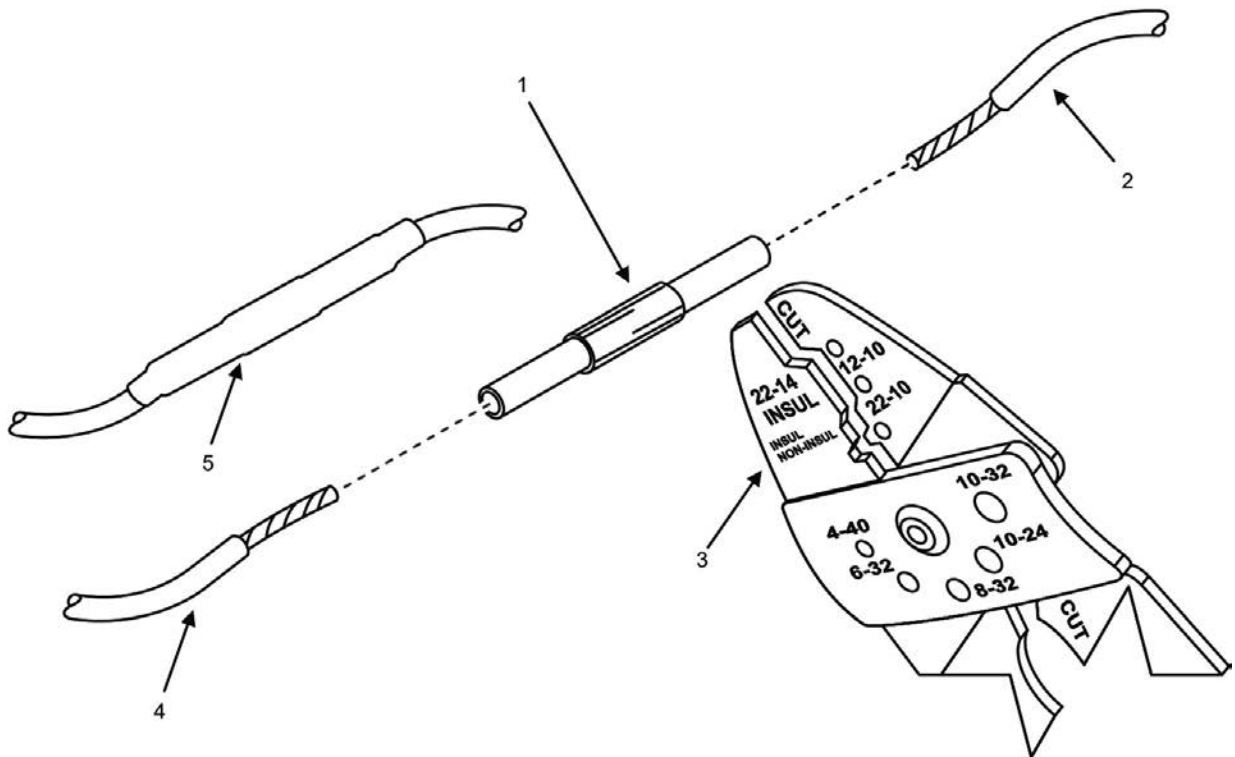
**Figure 8. Winterization Kit Pin Connector.**

- Identify electrical connector containing failed contact.
- Disconnect wiring harness from electrical component.
- Test contacts of electrical connector using a multimeter to determine failed contact within the connector.
- Remove failed contact (Figure 8, Item 2) by inserting the extraction tool fully into the connector (Figure 8, Item 1) at the failed contact (Figure 8, Item 2). When the extraction tool reaches its full travel, the locking tabs on the failed contact (Figure 8, Item 2) are released.
- Pull wire lead (Figure 8, Item 3) connected to failed contact (Figure 8, Item 2) gently from the rear of connector (Figure 7, Item 1) to remove failed contact (Figure 8, Item 2).
- Remove failed contact (Figure 8, Item 2) from wire lead (Figure 8, Item 3). Discard failed contact (Figure 8, Item 2).
- Slide seal (Figure 8, Item 4) further on wire lead (Figure 8, Item 3).

- h. Strip insulation from wire lead (Figure 8, Item 3) to the length of new contact wire well.
- i. Crimp new contact (Figure 8, Item 2) to wire lead (Figure 8, Item 3) using proper crimping tool.
- j. Test new contact (Figure 8, Item 2) using a multimeter to verify continuity is present using wire diagram as a guide to identify the correct circuit.
- k. Grasp wire lead (Figure 8, Item 3) approximately 1.0 in (25 mm) behind new contact (Figure 8, Item 2).
- l. Insert new contact (Figure 8, Item 2) and wire lead (Figure 8, Item 3) straight into rear of connector (Figure 8, Item 1) until a click is felt.
- m. Pull gently on wire lead (Figure 8, Item 3) to verify contact (Figure 8, Item 2) is locked into connector (Figure 8, Item 1).
- n. Install seal (Figure 8, Item 4) into connector (Figure 8, Item 1) until outer surface of seal (Figure 8, Item 4) is flush with outer surface of connector (Figure 8, Item 1).
- o. Install repaired connector (Figure 8, Item 1) to electrical component.
- p. Check electrical component for proper operation. Repair as required.

**Table 6. Winterization Kit Connector Repair.**

ELECTRICAL COMPONENT (#)	CONTACT TYPE	NO. CONTACTS
Winterization kit — fuel metering pump (P21)	Pin	2



**Figure 9. Butt Connector.**

## NOTE

Butt connectors are installed to repair (splice) in-line damage to an electrical wire. If damage to wire is longer than a replacement butt connector, use two butt connectors and a length of appropriate replacement wire to make a splice repair.

8. Install butt connector.
  - a. Locate in-line damage to electrical wire and determine size of wire and butt connector required.
  - b. Remove and discard damaged section of wire from wiring harness.
  - c. Remove the insulation from each end of the original wiring harness ends (Figure 9, Items 2 and 4).
  - d. Cut a piece of shrink wrap (Figure 9, Item 5) 1.0 in (25 mm) longer than the butt connector (Figure 9, Item 1) being used for the repair.
  - e. Slide shrink wrap (Figure 9, Item 5) over one end of the original wiring harness ends (Figure 9, Items 2 or 4).
  - f. Crimp both ends of original wiring harness (Figure 9, Items 2 and 4) into butt connector (Figure 9, Item 1) using a wire crimping tool (Figure 9, Item 3).
  - g. Slide shrink wrap (Figure 9, Item 5) over the installed butt connector (Figure 9, Item 1). Be sure entire butt connector (Figure 9, Item 1) is covered and shrink wrap (Figure 9, Item 5) is overlapping original wiring harness ends (Figure 9, Items 2 and 4).
  - h. Heat shrink wrap (Figure 9, Item 5) until it has tightly covered butt connector (Figure 9, Item 1)
  - i. Check electrical component for proper operation. Repair as required.

## END OF TASK

### Installing InPower AMMPS to a Compatible PC

1. Ensure compatible PC meets the following requirements:
  - a. Windows 2000, Windows XP, Windows Vista, or Windows 7 32-bit operating system. Installer will detect an unsupported system and abort the installation.
  - b. Internet Explorer 5.5 or above installed and running on the system. Installation cannot proceed if the Internet Explorer version is less than 5.5.
  - c. .Net Framework 2.0 or above for certain utilities and programs to work. Utilities will not work if version 2.0 or above is not available on the system, but installation will proceed.
  - d. A user login and administrative rights on compatible PC for installation. On Windows 7 and Vista operating systems, installation will fail without administrative rights. See administrator for administrative rights if installation fails.
  - e. Any previous version of InPower AMMPS removed from compatible PC IAW standard uninstall procedure.

## NOTE

A CD with InPower AMMPS software is issued with each generator set. When using Windows 2000, the V2.0 InPower AMMPS CD folder must be manually opened from [My Computer]. When using Windows XP, the [Open folder to view files using Windows Explorer] option must be chosen from a dialog box that automatically displays. Windows Vista and 7 will automatically run the setup.exe without any prompt.

2. Run setup for InPower AMMPS V2.0.

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**CAUTION**

Default path setting must be used as the destination folder. Restrictions are on a few folders for some operating systems. If restricted paths are selected, select an alternative path. Failure to comply may cause damage to equipment.

**NOTE**

Installer will check all prerequisites to perform installation. If any prerequisite is not met, then installer will inform user. If entire prerequisite is available, tool will check for previous versions of InPower AMMPS. Installer will not install InPower AMMPS if the same version or a newer version of InPower AMMPS is already installed on the PC.

3. Click [Next] and ensure step 1a – 1e conditions are met if an item is not checked during prerequisite check.

**NOTE**

Read each screen before making selection.

4. Make selections and click [Next] on the next four screens to install InPower AMMPS at default settings onto PC.

**NOTE**

Installer may run for several minutes depending on PC performance.

5. Select [Next] to finish installation and view [ReadMe] file.
6. Select [Next] once finished viewing [ReadMe] file.
7. Select [Finish] once setup has completed successfully.
8. Select and open InPower AMMPS icon from desktop or start menu to confirm proper operation.

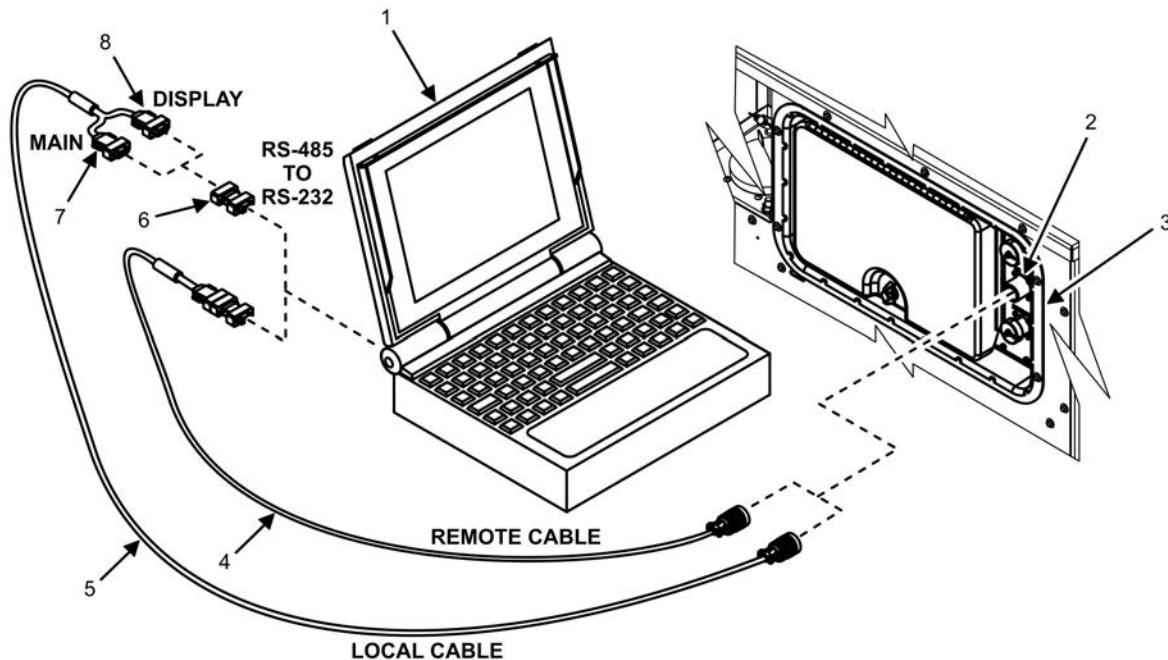
**END OF TASK**

## Using InPower AMMPS on a Compatible PC

### NOTE

Figure 10 shows a remote cable (Figure 10, Item 4) and a local cable (Figure 10, Item 5). Both cables utilize a RS-485 to RS-232 converter (Figure 10, Item 6). The RS-485 side of the converter plugs into the cable. The RS-232 side plugs into the compatible PC COM Port 1.

The remote cable (Figure 10, Item 4) supports both remote operating software and InPower AMMPS use. The local cable (Figure 10, Item 5) with DISPLAY (Figure 10, Item 8) and MAIN (Figure 10, Item 7) adapters must be used when performing initial or update calibration functions and downloading log files with InPower AMMPS.



**Figure 10. PC and DCS Connections.**

1. Install battery ground cable (WP 0037, Remove/Install Batteries) and ensure battery power is supplied to the DCS (main DC circuit breaker ON (TM 9-6115-752-10)).

### NOTE

DCS screen will activate upon connection of remote or local cable (Figure 10, Items 4 and 5).

2. Connect a remote cable (Figure 10, Item 4) or local cable (Figure 10, Item 5) to the DCS (Figure 10, Item 3) at REMOTE port (Figure 10, Item 2) and to a compatible PC (Figure 10, Item 1) using MAIN (Figure 10, Item 7) adapter and RS-485 to RS-232 converter (Figure 10, Item 6).
3. Select and open InPower AMMPS icon from desktop or start menu. Install if necessary. See Installing InPower AMMPS to a Compatible PC task.



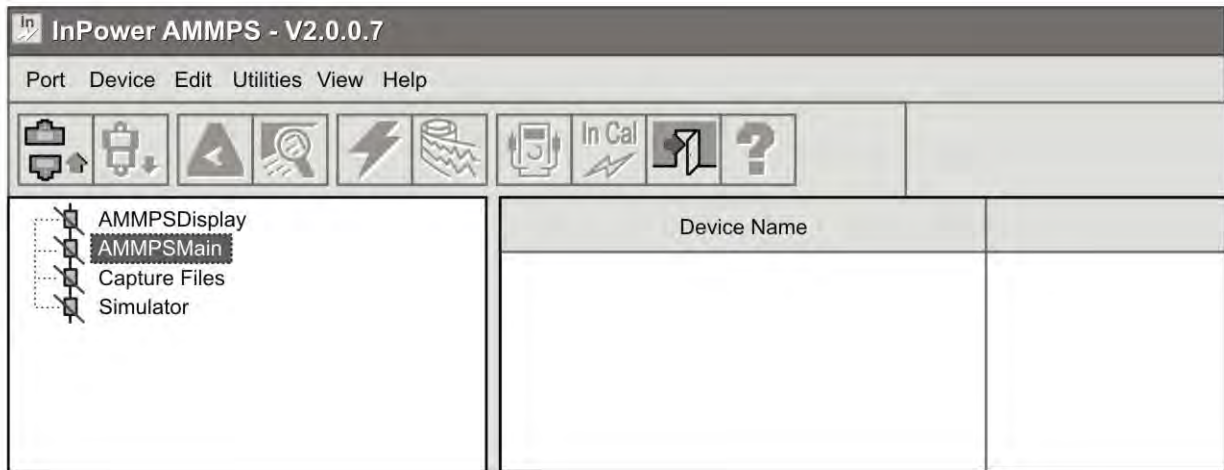


Figure 11. AMMPS Main.

4. Select [AMMPSMain] from left-side explorer pane (Figure 11).

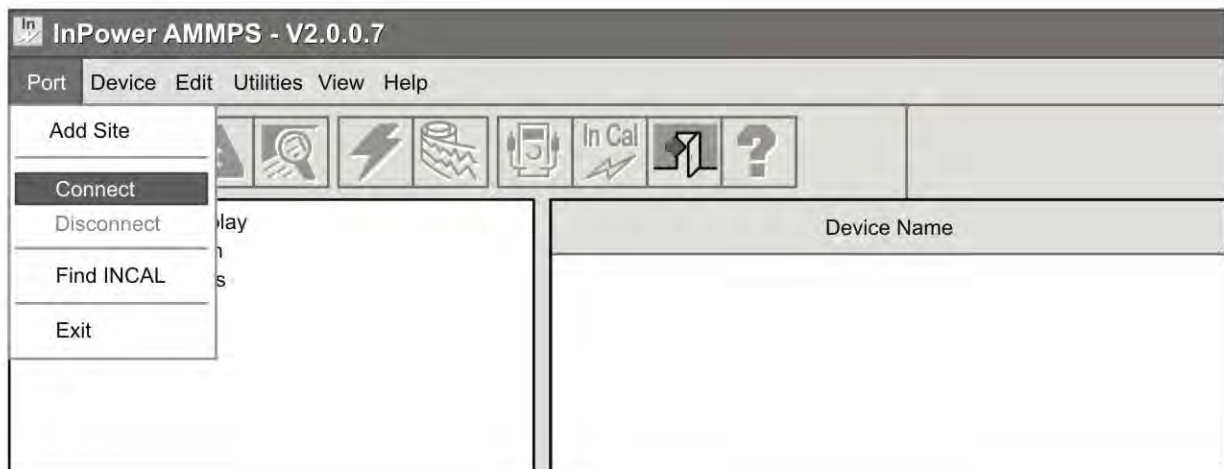


Figure 12. Port Connect.

5. Right-click on [AMMPSMain] or select [Port] from menu bar (Figure 12).
6. Select [Connect] from drop-down menu (Figure 12).
7. Check the following if InPower AMMPS fails to connect:
  - a. Ensure COM port for [AMMPSDisplay] or [AMMPSMain] is correct and not being used by another device or program. Access [Add Site] from [Port] drop-down menu to change COM port or add a different COM port site.
  - b. Ensure proper RS-485 adapter is being utilized and is installed correctly (Figure 10).
  - c. Ensure battery power is supplied to DCS and DCS is powered on (step 1).
  - d. Check all cables for proper installation and connections (step 2).

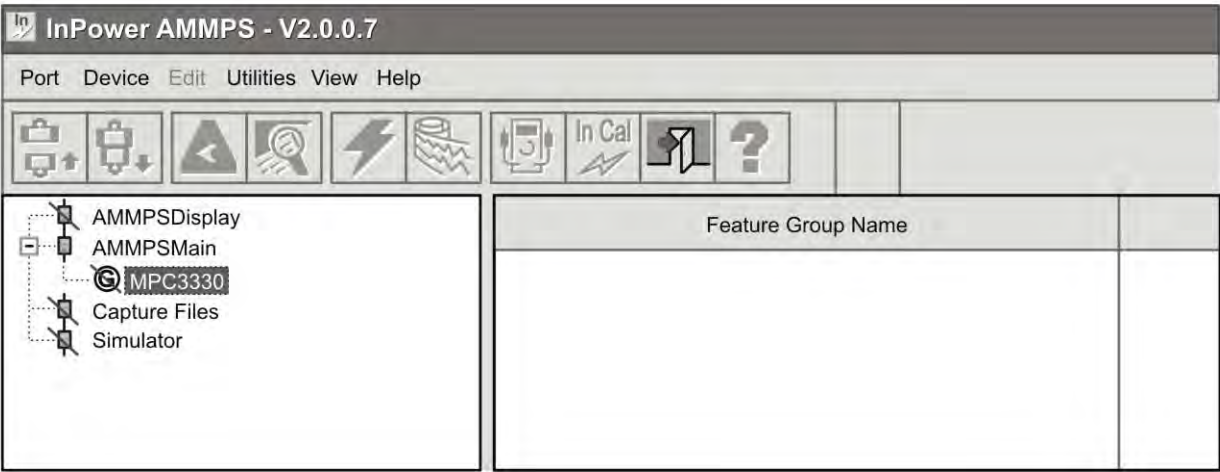


Figure 13. Device MPC3330.

8. Select device [MPC3330] once connected to [AMMPSTMain] (Figure 13).

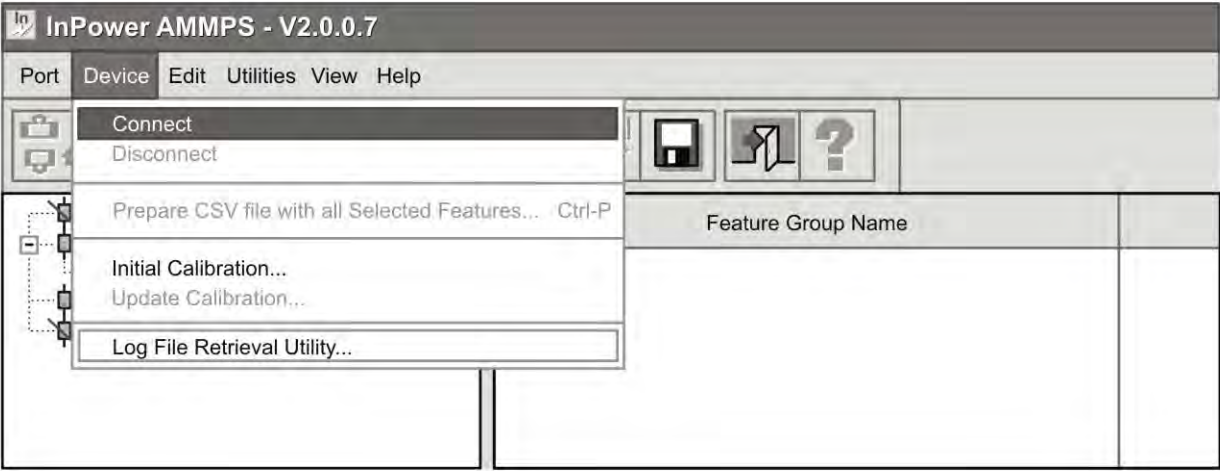


Figure 14. Device Connect.

9. Right-click on [MPC3330] or select [Device] from menu bar (Figure 14).  
10. Select [Connect] from drop-down menu (Figure 14).

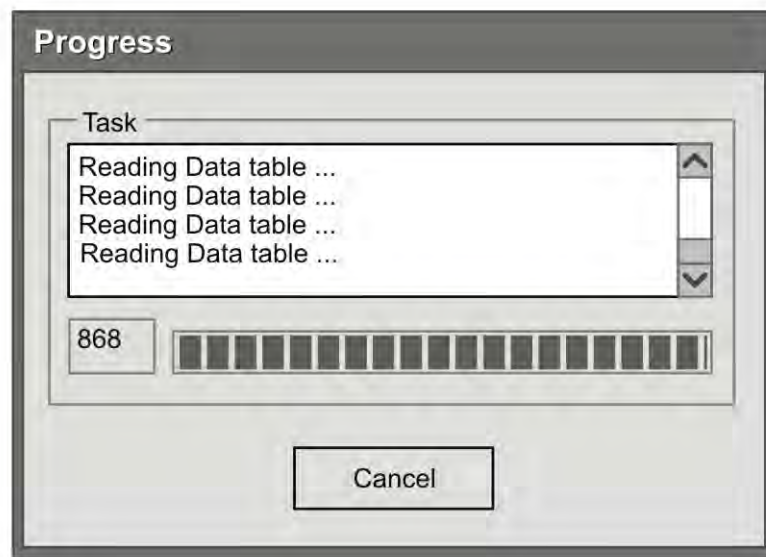


Figure 15. Data Table.

### NOTE

Depending on performance of computer, DCS data may take several minutes to load.

11. View [Progress] dialog box as InPower AMMPS imports data from DCS (Figure 15).

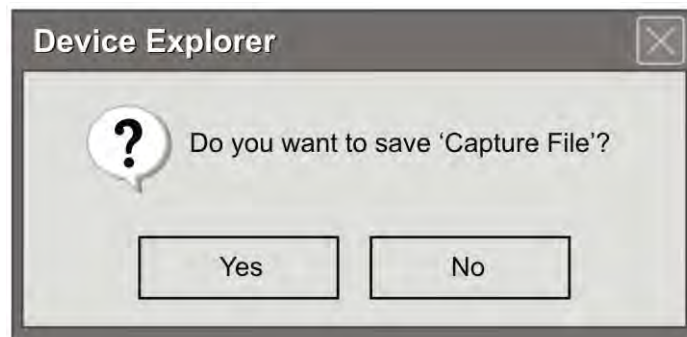


Figure 16. Capture File Yes or No.

### NOTE

A capture file is required to perform Using a Capture File to Overlay Data task. Default location for capture file is shown in Figure 17.

12. Perform one of the following when dialog box displays (Figure 16):
  - a. Select [Yes] to save a capture file and:
    - (1) Use default name and default location (Figure 17).

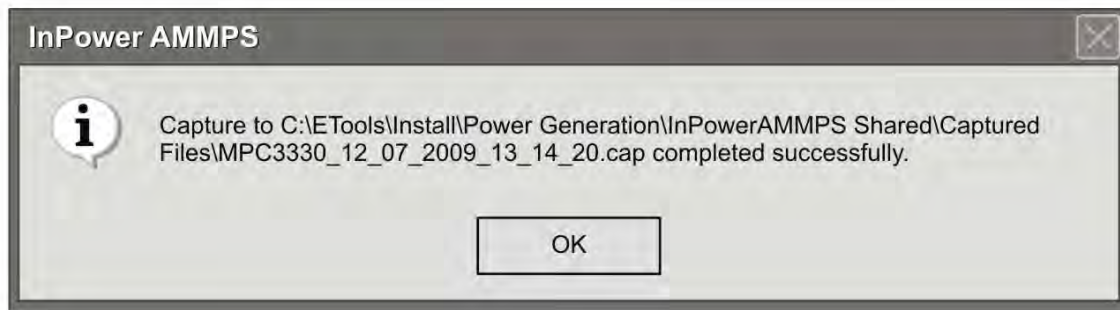
**NOTE**

A progress bar will show the save process.

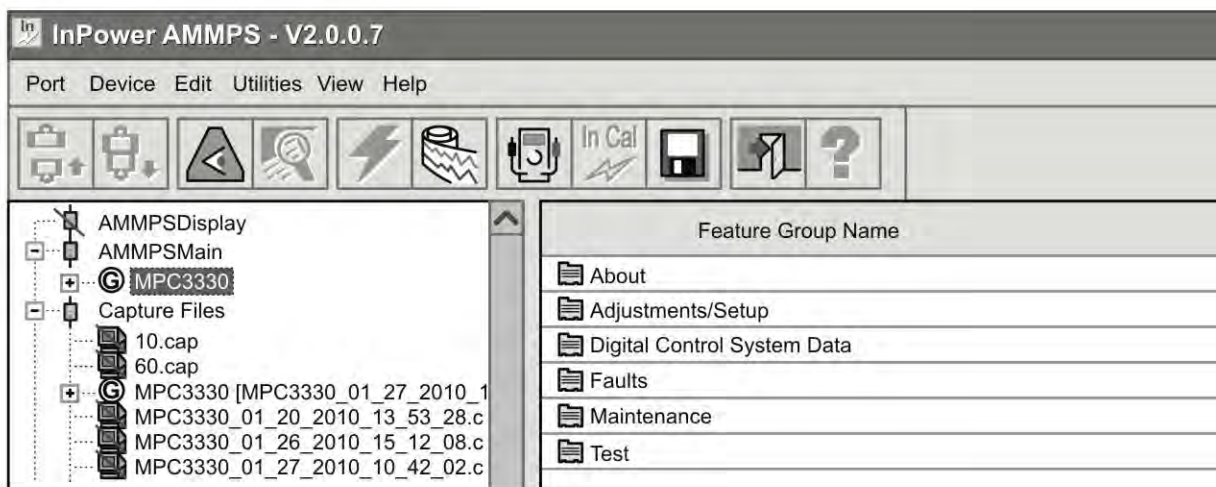
(2) Select [Save].

(3) Select [OK] once InPower AMMPS captures file successfully (Figure 17).

b. [No] if capture file will not be saved.



**Figure 17. Capture File.**



**Figure 18. InPower AMMPS Maintenance.**

13. Use InPower AMMPS for maintenance or troubleshooting as required (Figure 18).

**END OF TASK**

## Downloading Log Files from DCS

### NOTE

Log File Retrieval Utility can be accessed only after connecting to [AMMPSTDisplay] device through InPower AMMPS.

1. Ensure battery ground cable is installed (WP 0037, Remove/Install Batteries) and ensure battery power is supplied to the DCS (main DC circuit breaker ON (TM 9-6115-752-10)).

### NOTE

Figure 10 shows a remote cable (Figure 10, Item 4) and a local cable (Figure 10, Item 5). Both cables utilize a RS-485 to RS-232 converter (Figure 10, Item 6). The RS-485 side of the converter plugs into the cable. The RS-232 side plugs into the compatible PC COM Port 1. DISPLAY (Figure 10, Item 8) adapter will be used for step 2.

2. Connect a local cable (Figure 10, Item 5) (with DISPLAY (Figure 10, Item 8) adapter) to the DCS (Figure 10, Item 3) and a compatible PC (Figure 10, Item 1).

### NOTE

DCS screen will activate upon connection of cable.

3. Select and open InPower AMMPS icon from desktop or start menu. Install if necessary. See Installing InPower AMMPS to a Compatible PC task.
4. Select [AMMPSTDisplay] from left-side explorer pane (Figure 19).
5. Double-click on [AMMPSTDisplay] (Figure 19) or select [Connect] from [Port] drop-down menu (Figure 20).

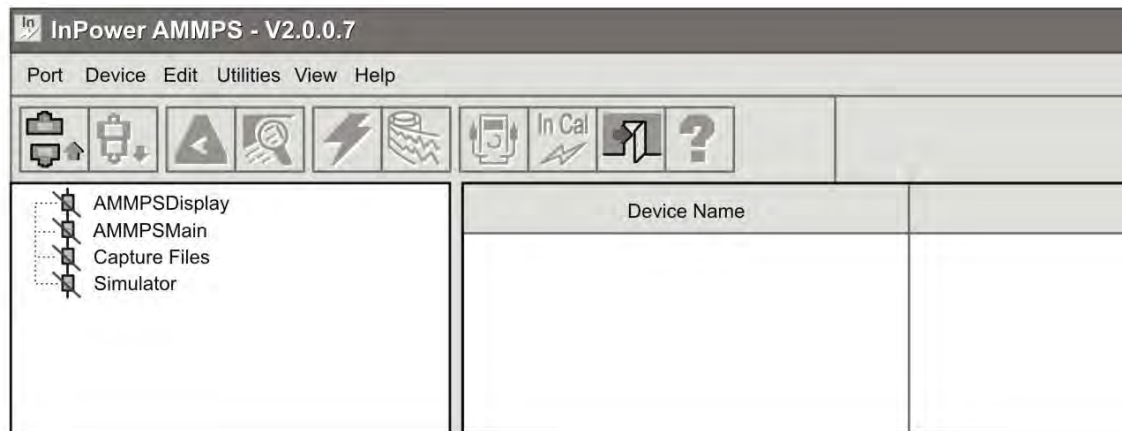
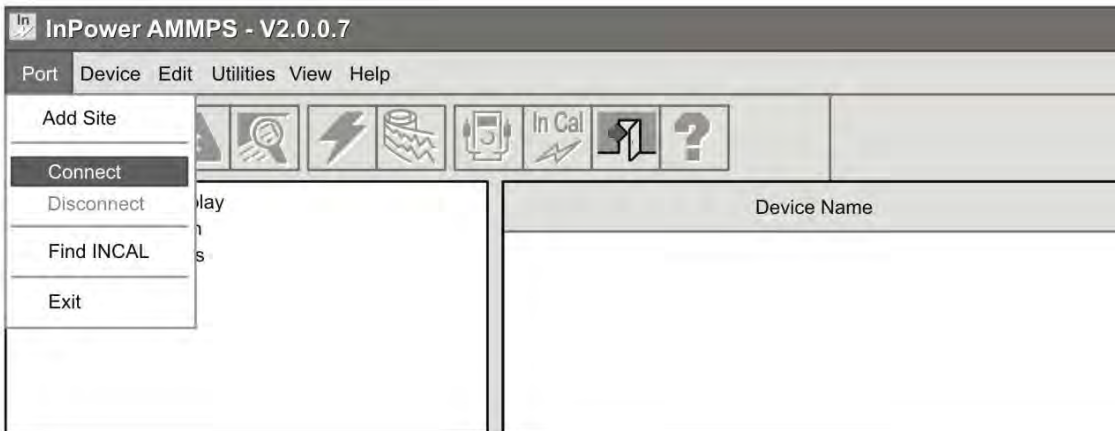
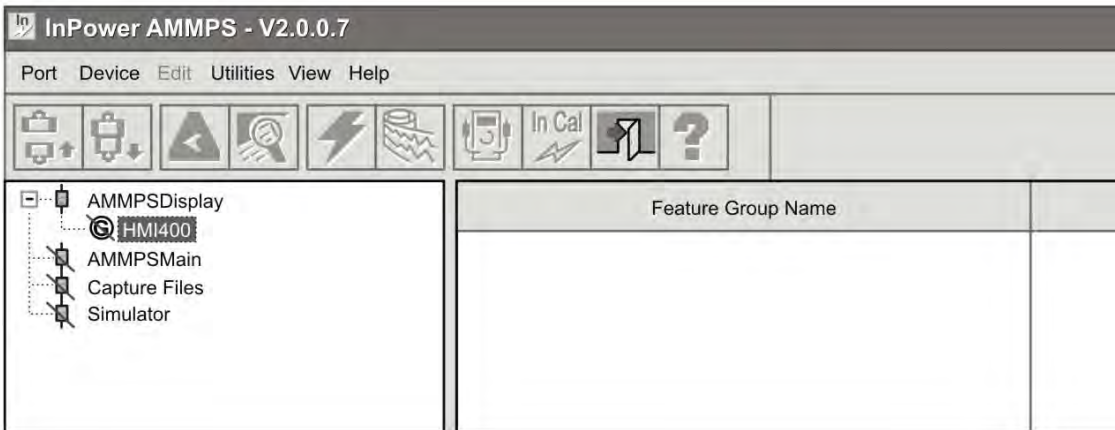


Figure 19. AMMPS Display.



**Figure 20. Port Connect for AMMPS Display.**

6. Check the following if InPower fails to connect:
  - a. Ensure COM port for [AMMPSDisplay] is correct and not being used by another device or program. Access [Add Site] from [Port] drop-down menu to change COM port or add a different COM port site.
  - b. Ensure proper RS-485 adapter is being utilized and is installed correctly (Figure 10).
  - c. Ensure battery power is supplied to DCS and DCS is on (step 1).
  - d. Check all cables for proper installation and connections (step 2).



**Figure 21. Device HMI400.**

7. Select [HMI400] from left-side explorer pane (Figure 21).
8. Select [Connect] from [Device] drop-down menu (Figure 22).



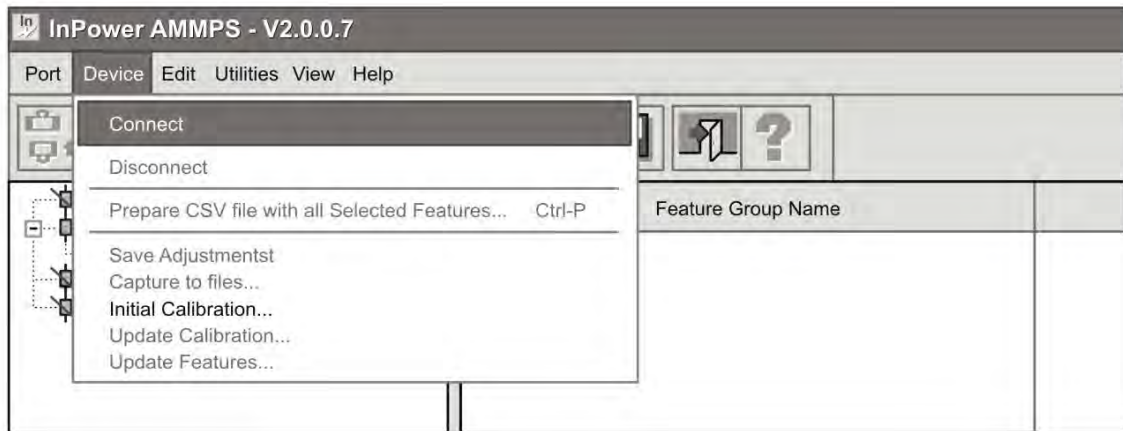


Figure 22. Device Connect for AMMPS Display.

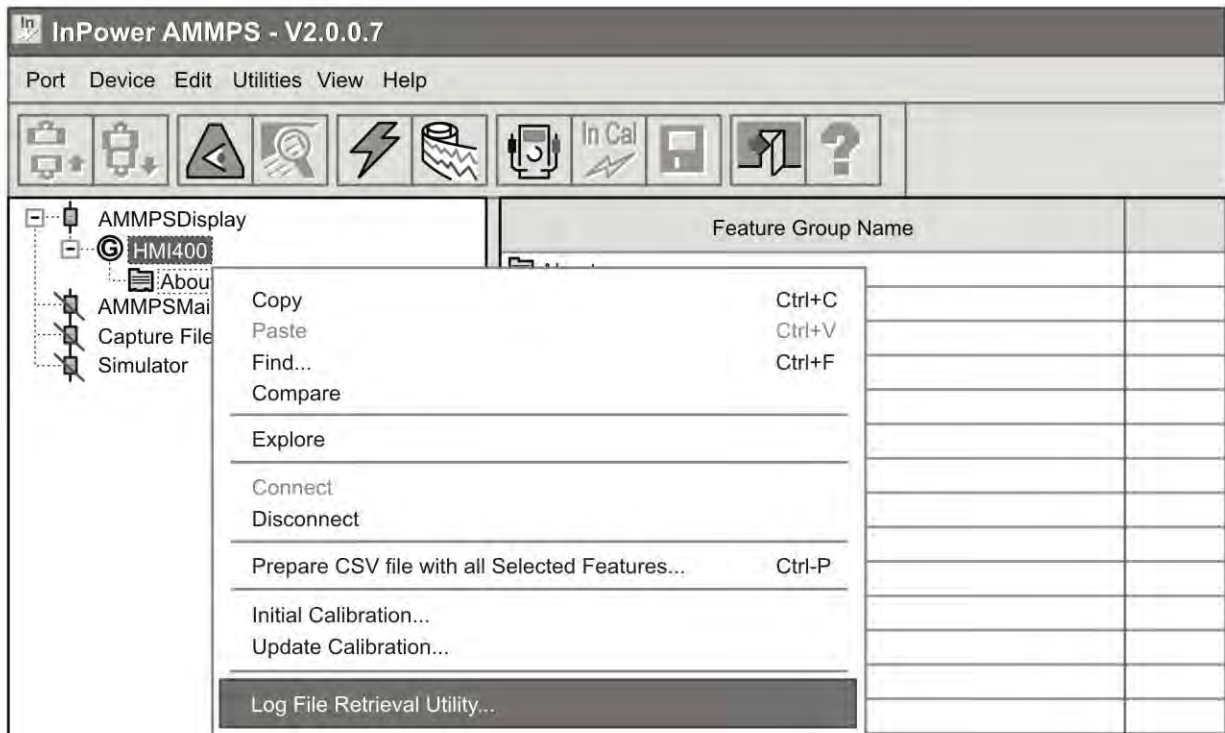
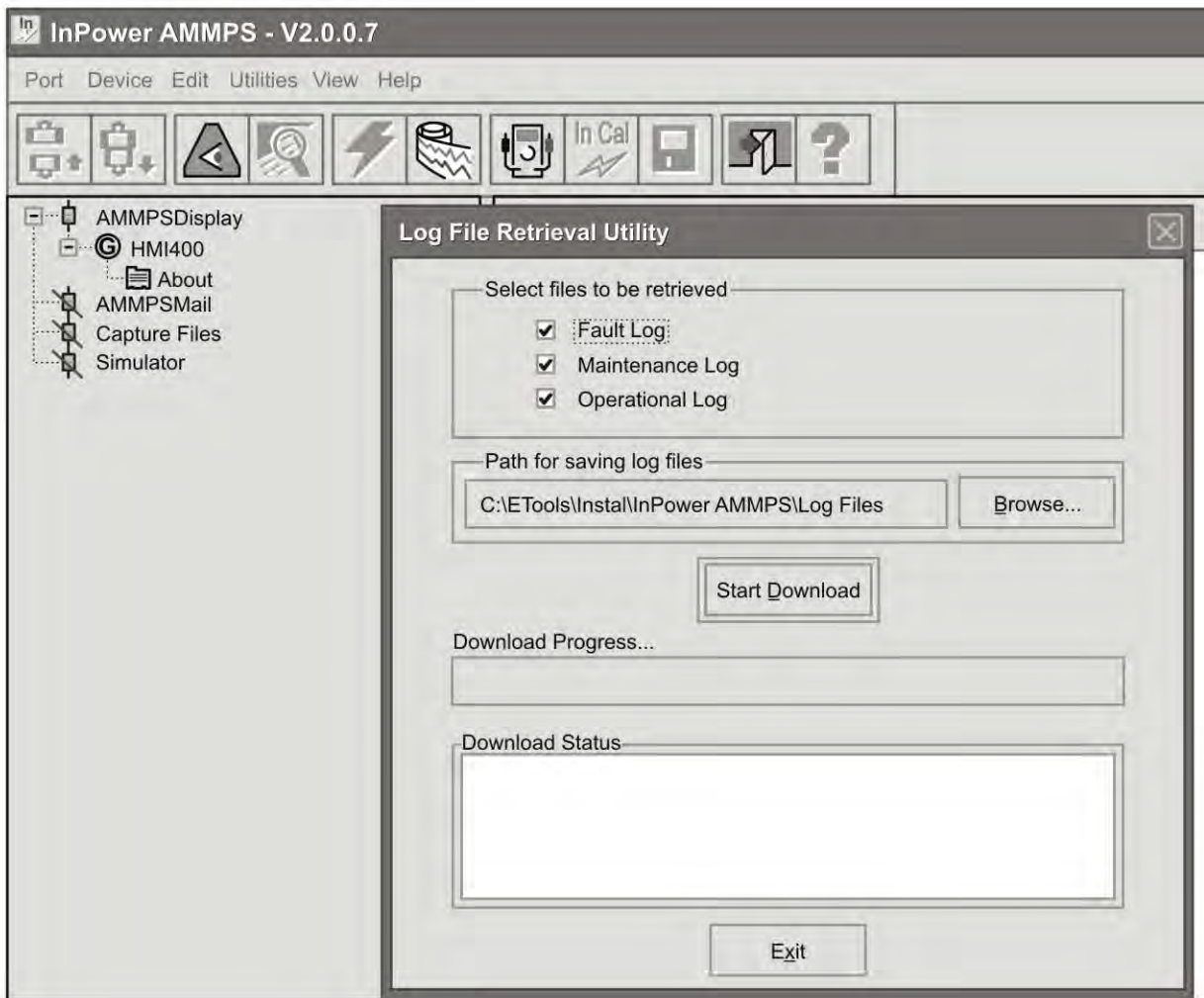


Figure 23. Log File Retrieval Utility.

### NOTE

Log File Retrieval Utility can also be accessed through [Device] on menu bar.

9. Right-click [HMI400] from left-side explorer pane once connected (Figure 23) and select [Log File Retrieval Utility] to access dialog box (Figure 24).



**Figure 24. Log File Retrieval Utility Dialog Box.**

10. Select/de-select any of the log files (Figure 24) for retrieval:

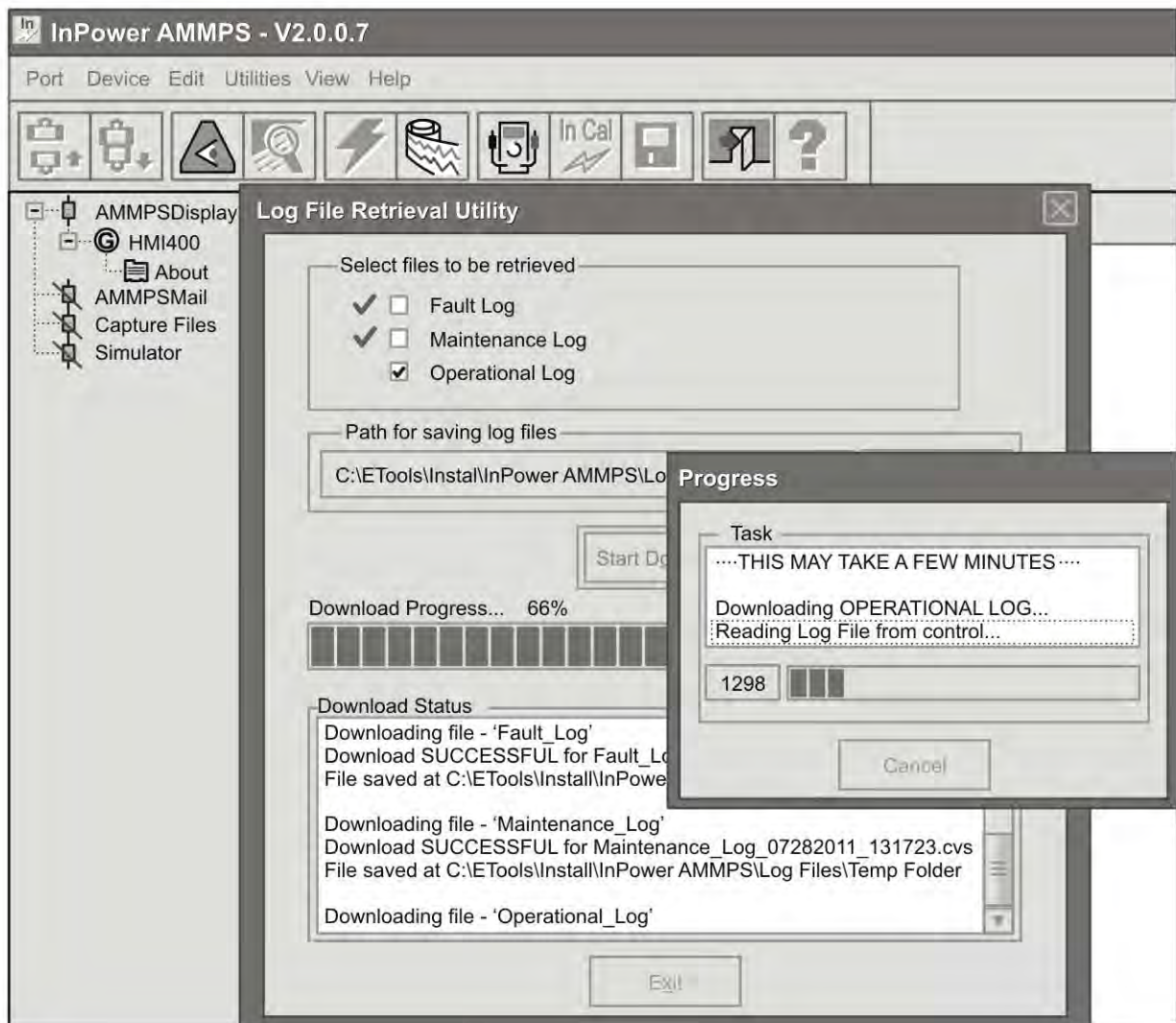
- a. [Fault Log].
- b. [Maintenance Log].
- c. [Operational Log].

### NOTE

Default path for saving log files is C:\ETools\Instal\InPower AMMPS\Log Files.

11. Use [Browse] button (Figure 24) to change save location for log(s), if different location is desired.



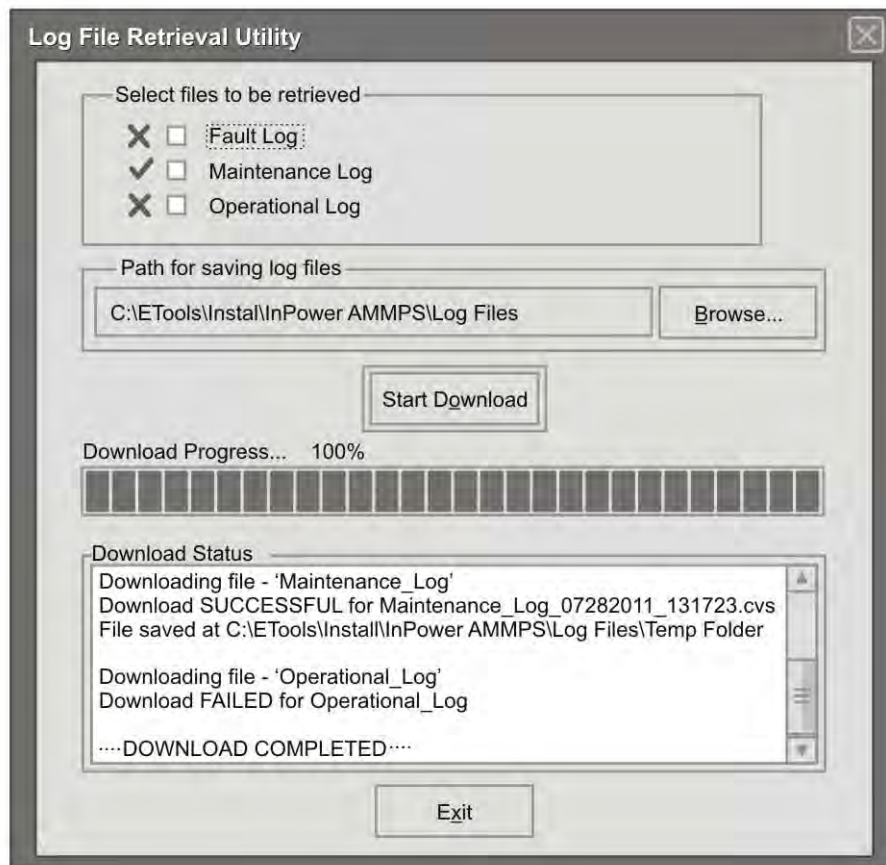


**Figure 25. Log File Retrieval Utility Download.**

### NOTE

Download time (Figure 25) will vary depending on the size of the files within the control and the connection speed (baud rate).

12. Click [Start Download] button (Figure 24).



**Figure 26. Log File Retrieval Utility Download Status.**

### NOTE

A green check mark (Figure 26) will appear next to the selected file(s) once file(s) is downloaded successfully. A red cross next to file(s) and indication DOWNLOAD FAILED in [Download Status] will appear for any file that fails to download. Figure 26 shows successful [Maintenance Log] download, failed [Fault Log] download, and failed [Operational Log] download.

13. Check [Download Status] message box (Figure 26) to ensure logs download properly.
14. Start a new download or click [Exit] (Figure 26) when all desired downloads are complete.

### NOTE

Log files are Comma-Separated Values (CSV) files. A compatible program, such as Microsoft Excel, is required for viewing. Files can be copied and renamed onto a desktop without opening and viewing.

15. Open selected log from default path or saved location and review data in file.
16. Remove local cable (Figure 10, Item 5) (with DISPLAY (Figure 10, Item 8) adapter) from the DCS (Figure 10, Item 3) and compatible PC (Figure 10, Item 1).

### END OF TASK

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## Using a Capture File to Overlay Data

### CAUTION

It is important to save the latest capture file from DCS being replaced. Data can only be accessed using InPower AMMPS and a MSD hard drive (or compatible computer). If data is accessible, capture file can be used to overlay parameters and maintenance timers from the replaced DCS. If unable to access capture file data, maintenance timers will be reset and some parameters from replaced DCS will be lost. Use latest hard copy records to determine when maintenance actions are due. Failure to comply will cause damage to equipment.

It is important to save log data from DCS being replaced. The maintenance, operational, and fault logs should be downloaded from the DCS with InPower and saved to the hard drive of a MSD (or compatible computer). Maintenance, operational, and fault logs cannot be uploaded to the new DCS, but can be saved for reference. All logs will start over with a new DCS. If unable to access logs, use latest hard copy records to access operational, maintenance, and fault events. Failure to comply may cause damage to equipment.

### NOTE

DCS that contains desired data will be referred to as DCS 1. DCS 2 is the destination DCS. DCS 2 can either be the same DCS after a calibration has been completed or a new DCS that is replacing a failed DCS.

Capture files can be stored in the [Captured Files] folder on the hard drive of a PC. They can also be removed and placed in an easy access location such as a desktop, CD, or memory drive. If a different PC will be used to upload capture file to DCS 2, capture file must be copied and pasted to PC that will be used.

1. Connect to [AMMPSMain] of DCS 1 and ensure capture file is saved. See Using InPower AMMPS on a Compatible PC task.
2. Use explorer pane of PC to access [C:\ETools\Install\Power Generation\InPowerAMMPS Shared\Captured Files] on the computer hard drive.

### NOTE

Capture files can be renamed and stored in the [Captured Files] folder on the hard drive of a PC. They can also be removed and placed in an easy access location such as a desktop, CD, or memory drive. If a different PC will be used to upload capture file to DCS 2, capture file must be copied and pasted to PC that will be used.

3. Copy and paste desired (most recent) capture file to selected location and rename as DCS 1 or rename capture file as DCS 1 and leave in current location.
4. Disconnect InPower AMMPS from DCS.
5. Record engine hours of DCS 1 and save for use with DCS 2.
6. Disconnect from [AMMPSMain] and remove local cable (Figure 10, Item 5) (with MAIN (Figure 10, Item 7) adapter).
7. Paste capture file from DCS 1 into [C:\ETools\Install\Power Generation\InPowerAMMPS Shared\Captured Files] on the PC hard drive if moving capture file from one PC or location to another.
8. Connect to [AMMPSMain] of DCS 2. See Using InPower AMMPS on a Compatible PC task.

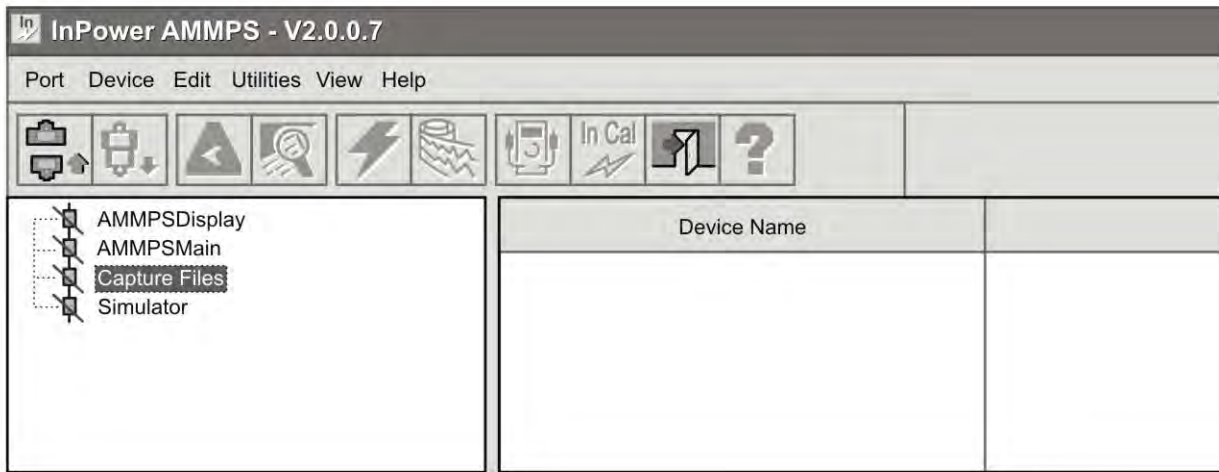


Figure 27. Capture File Explorer.

9. Select [Capture Files] from explorer pane (Figure 27).

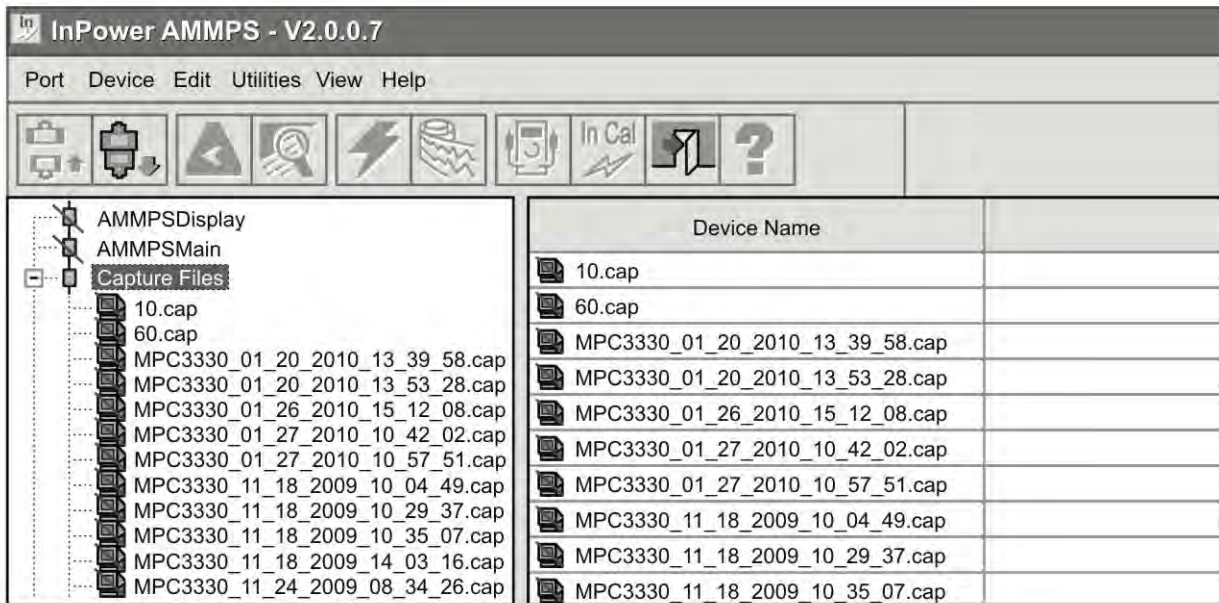
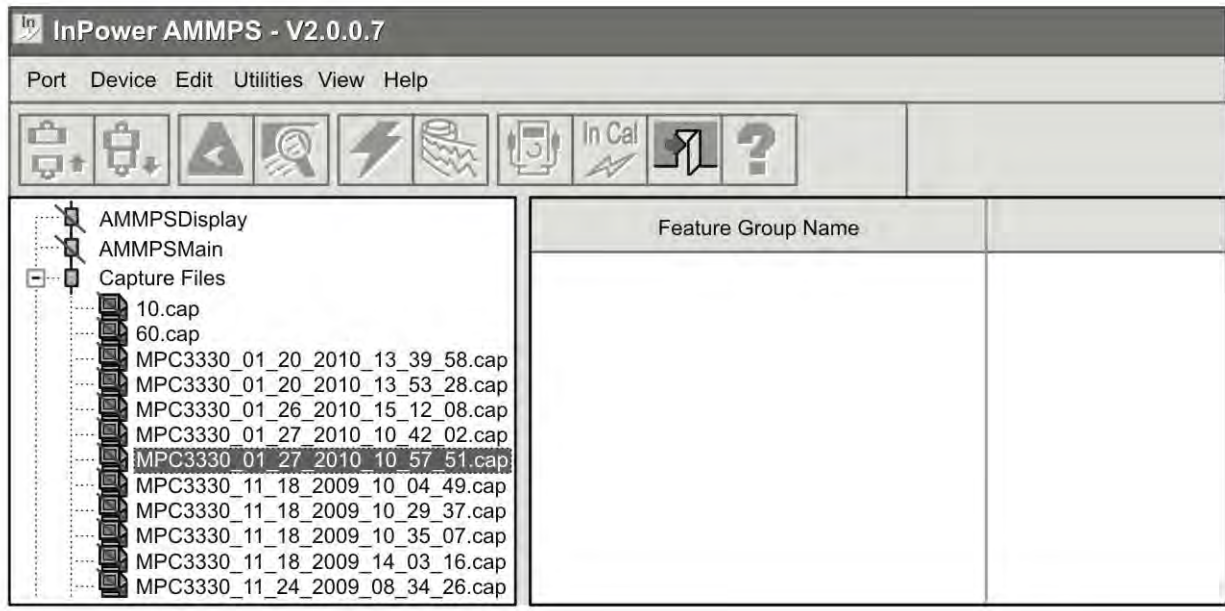


Figure 28. Open Capture Files Explorer.

10. Double-click on [Capture Files] to display available [Capture Files] (Figure 28).

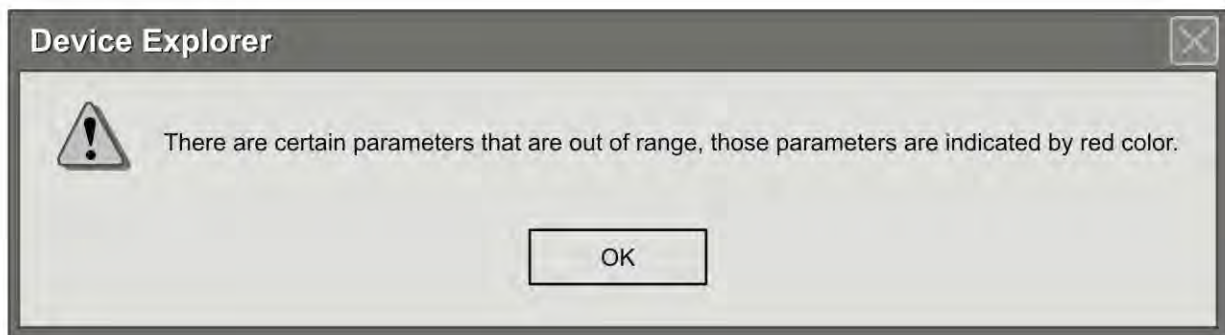


**Figure 29. Select Capture File.**

### NOTE

Selected capture file shown in Figure 29 is an example. Any desired capture file can be selected and used as long as data required has been captured in file.

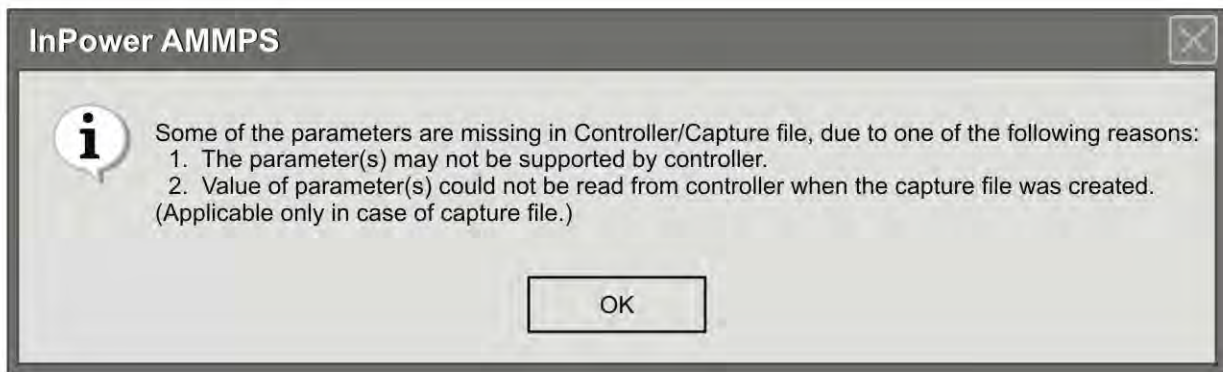
11. Select desired capture file from DCS 1 based on latest data captured or pasted to file (Figure 29).
12. Double-click selected capture file to connect and display capture file (Figure 29).



**Figure 30. Parameters Dialog Box.**

13. Choose [OK] when dialog box displays (Figure 30).



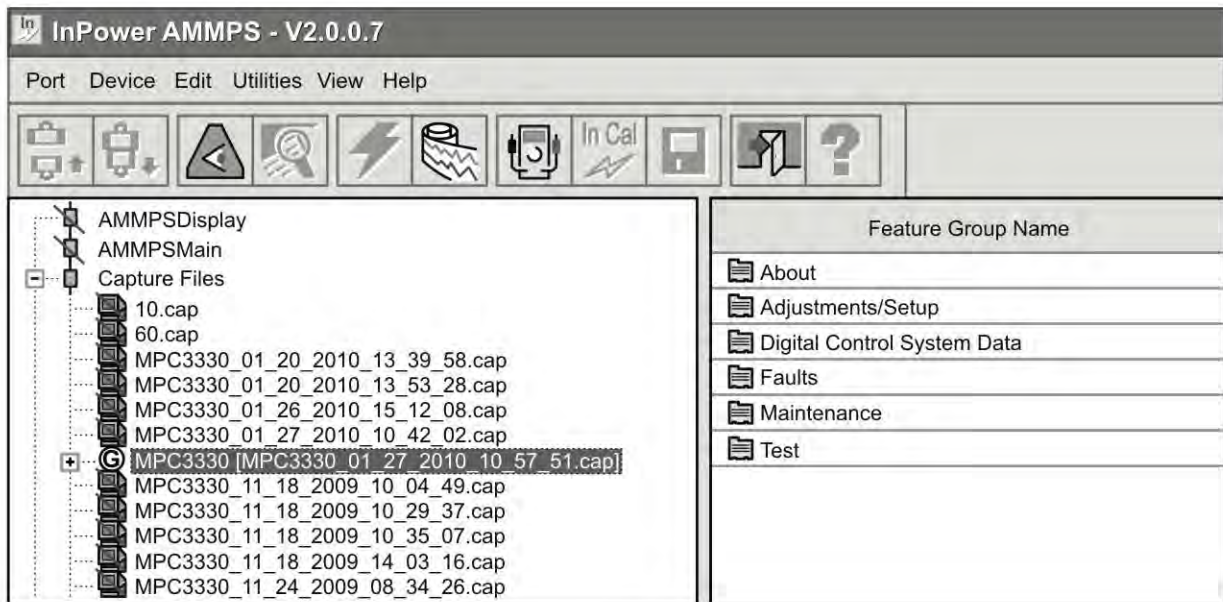


**Figure 31. Parameters Missing.**

### NOTE

A dialog box indicating missing parameters (Figure 31) may display due to missing information (such as a model number) or a problem with the capture file. Depending on the condition of DCS 1, some data may not have been copied to capture file. Continue to overlay available data. Remaining data can be entered as required. See step 19.

14. Choose [OK] if second dialog box displays (Figure 31).
15. Connect InPower AMMPS to [AMMPSMain] and [MPC3330] of DCS 2. See Using InPower AMMPS on a Compatible PC task.

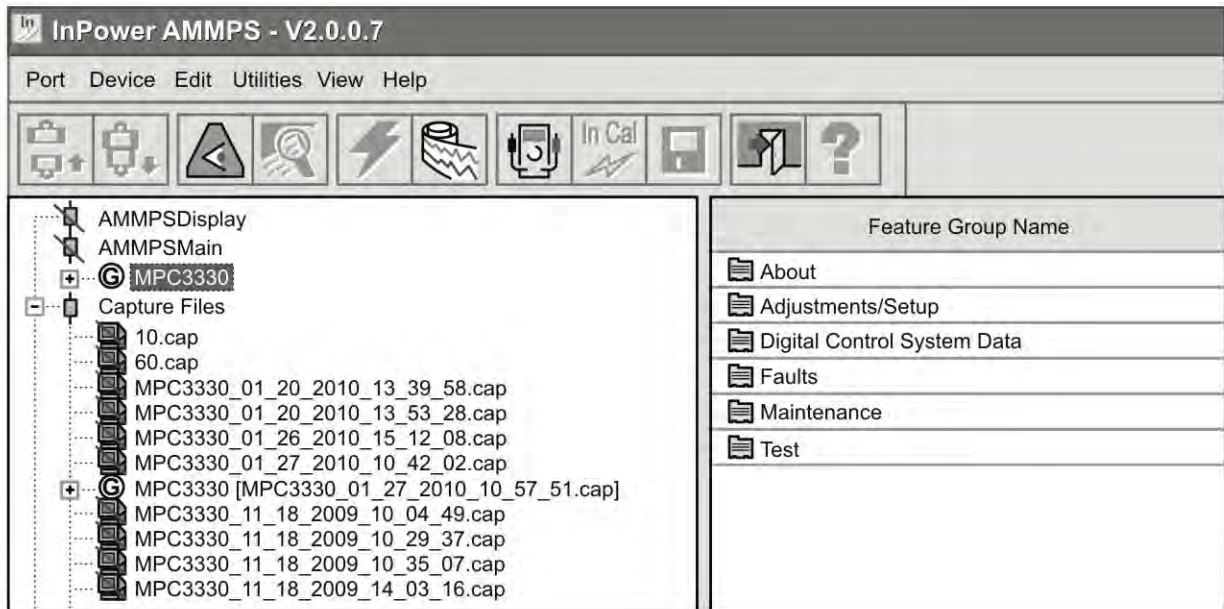


**Figure 32. Drag Capture File.**

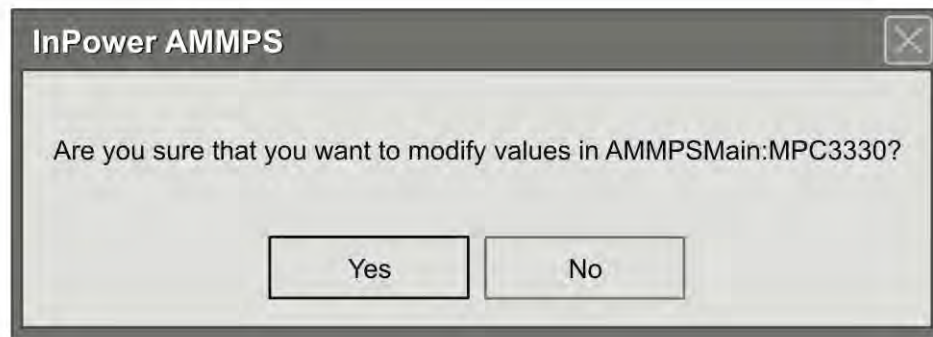
## NOTE

Before drag and drop, ensure InPower AMMPS is connected to [AMMPS Main] and [MPC3330] of DCS 2. Once selected, drag capture file from current location and drop to [AMMPSMain] to overlay file.

16. Select capture file (Figure 32) with mouse pointer and hold down left mouse button to drag and drop capture file to [AMMPSMain] device (Figure 33).



**Figure 33. Drop Capture File.**



**Figure 34. Modify Values.**

17. Choose [Yes] when dialog box displays (Figure 34).

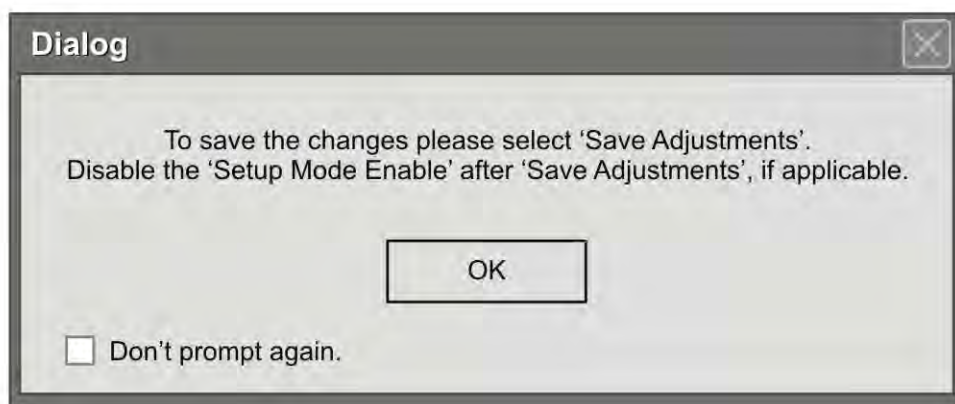


Figure 35. Save Adjustments.

18. Choose [OK] when dialog box displays (Figure 35).

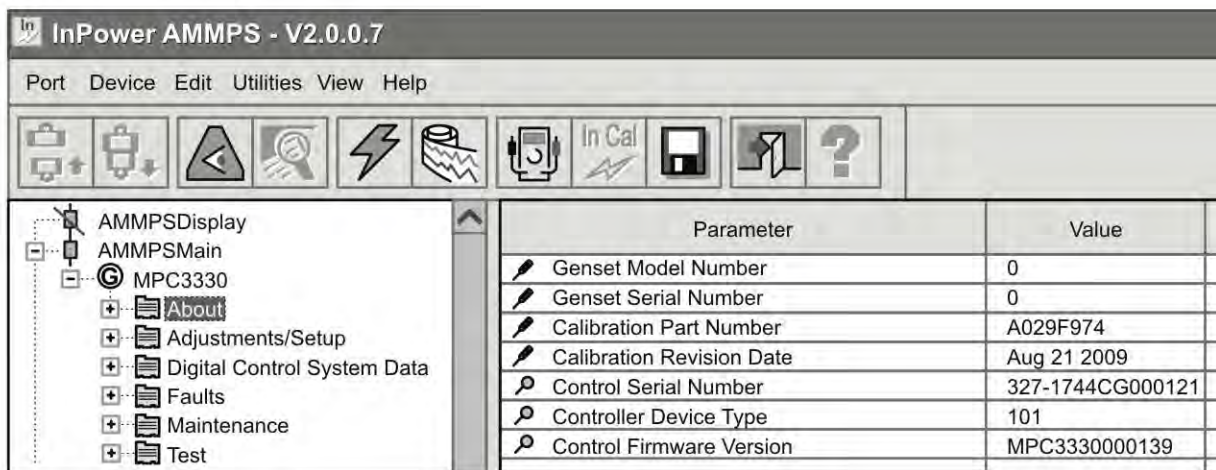


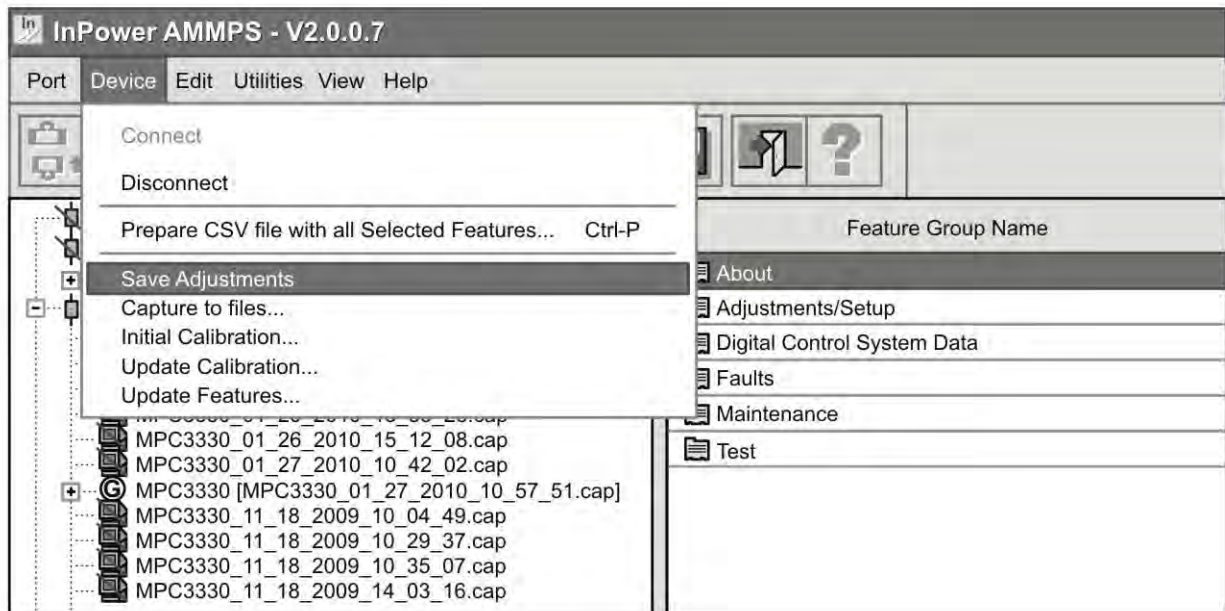
Figure 36. About Parameters.

### NOTE

[About] is shown in Figure 36 as an example of an option available from the explorer pane. [Adjustments/Setup], [Digital Control System Data], [Faults], [Maintenance], and [Test] are also all available for viewing. Adjustments to the parameters are only required when a value is missing or a value is desired that currently is not saved to a parameter.

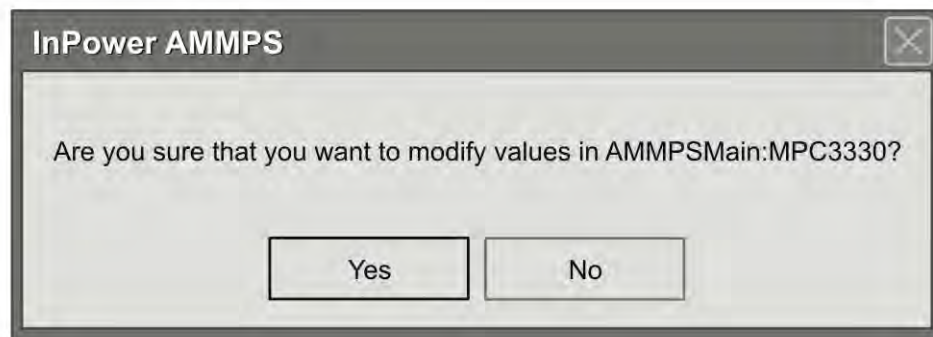
19. Select an option (e.g. [About]) from explorer pane under [MPC3330] device and modify parameters as required by double-clicking within [Value] and typing desired text (e.g. add model number to [Value] column of [Genset Model Number] Parameter) (Figure 36).





**Figure 37. Save Adjustments from Drop-Down Menu.**

20. Select [Save Adjustments] from [Device] drop-down menu (Figure 37) or select save icon shortcut (not shown).



**Figure 38. Confirm Modify Values.**

21. Select [Yes] when dialog box displays (Figure 38).

**Save Adjustments**

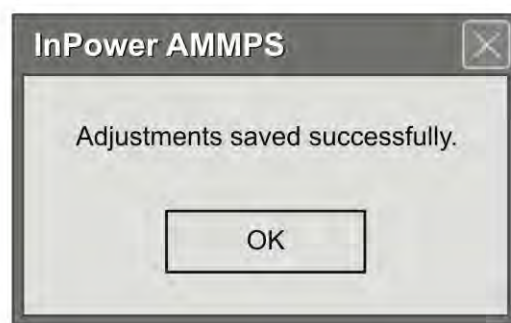
Site ID: AMMPMain      Device Name: MPC3330

Following parameter values have been changed. Do you want to permanently save the changes you have made?

Parameter Description	Old Value	New Value
Maintenance Item 5004 Countdown	700.20	750.06
Maintenance Item 5001 Countdown	0.15	250.02
Maintenance Item 5007 Countdown	1950.30	2000.16
Genset 3 Phase 400Hz Voltage Calibration	0.999	0.992
Calibration Revision Date	Nov 4 2009	Aug 21 2009
Maintenance Item 5017 Countdown	200.16	250.02
Maintenance Item 5014 Countdown	5.18	24.00
Maintenance Item 5011 Countdown	5.18	24.00
Maintenance Item 5006 Countdown	700.20	750.06
Maintenance Item 5003 Countdown	700.20	750.06
Genset 3 Phase 50/60Hz Voltage Calibration	0.996	0.988
Maintenance Item 5009 Countdown	450.18	500.04
Genset 240V Single Phase 50/60Hz Voltage Calibration	1.000	0.985
Genset 120V Single Phase 400Hz Voltage Calibration	1.001	0.978
Maintenance Item 5010 Countdown	1450.26	1500.12
Maintenance Item 5016 Countdown	200.16	250.02
Maintenance Item 5013 Countdown	2450.34	2500.20
Maintenance Item 5002 Countdown	700.20	750.06
Maintenance Item 5008 Countdown	1450.26	1500.12
Maintenance Item 5005 Countdown	1950.30	2000.16
Genset 120V Single Phase 50/60Hz Voltage Calibration	0.996	0.972
Genset 240V Single Phase 400Hz Voltage Calibration	1.005	0.991
Maintenance Item 5012 Countdown	4950.54	5000.40

**Figure 39. Confirm Save Adjustments.**

22. Review [Save Adjustments] dialog box for changes between [Old Value] column and [New Value] column (Figure 39).
23. Confirm parameters are the correct or desired changes for DCS 2 (Figure 39).
24. Compare hard copy records as required.
25. Double-click [New Value] column as required to adjust parameter values and click [Save] once adjustments are made (Figure 39).



**Figure 40. Saved.**

26. Select [OK] when [Adjustments saved successfully] displays in dialog box (Figure 40).
27. Retry capture file procedure if adjustments are not saved successfully. See steps 1 through 26.
28. Update engine hours using adjustments screen 2 based on recorded value from DCS 1 (TM 9-6115-752-10).
29. Turn main DC circuit breaker OFF (TM 9-6115-752-10).
30. Turn main DC circuit breaker ON (TM 9-6115-752-10).
31. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
32. Start engine and check for proper operation (TM 9-6115-752-10).
33. Repair as required.

## **END OF TASK**

### **Using Initial Calibration to Install Control Firmware Updates**

1. Install battery ground cable (WP 0037, Remove/Install Batteries) and ensure battery power is supplied to the DCS (main DC circuit breaker ON (TM 9-6115-752-10)).

## **NOTE**

Figure 10 shows a remote cable (Figure 10, Item 4) and a local cable (Figure 10, Item 5). Both cables utilize a RS-485 to RS-232 converter (Figure 10, Item 6). The RS-485 side of the converter plugs into the cable. The RS-232 side plugs into the compatible PC COM Port 1. MAIN (Figure 10, Item 7) adapter will be used for step 2.

2. Connect a local cable (Figure 10, Item 5) (with MAIN (Figure 10, Item 7) adapter) to the DCS (Figure 10, Item 3) and a compatible PC (Figure 10, Item 1).

## **NOTE**

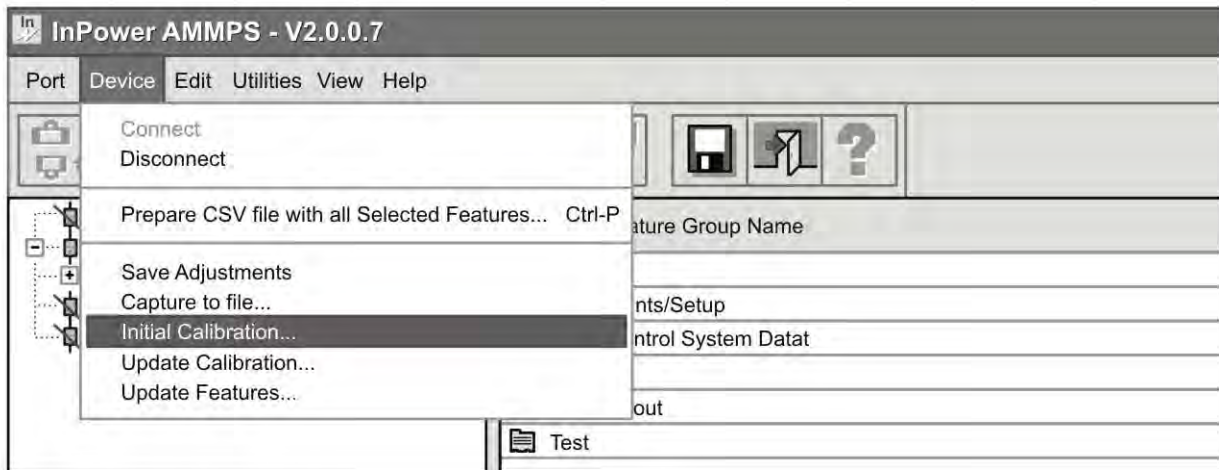
DCS screen will activate upon connection of cable.

3. Select and open InPower AMMPS icon from desktop or start menu. Install if necessary. See Installing InPower AMMPS to a Compatible PC task.

**NOTE**

[Initial Calibration] feature is used to download a new firmware version calibration file into a replacement or current DCS.

4. Connect to [AMMPSMain]. See Using InPower AMMPS on a Compatible PC task.
5. Mark or save a capture file as required. See Using a Capture File to Overlay Data task.



**Figure 41. Initial Calibration.**

**CAUTION**

Calibration steps must be followed in order presented. Failure to comply may cause damage to equipment.

**NOTE**

If a dialog box indicates that there is an error loading, the drive letter may not have been correctly specified during InPower AMMPS installation. The correct drive designation may need to be specified as required.

6. Click on the [Device] drop-down menu and select [Initial Calibration] (Figure 41).

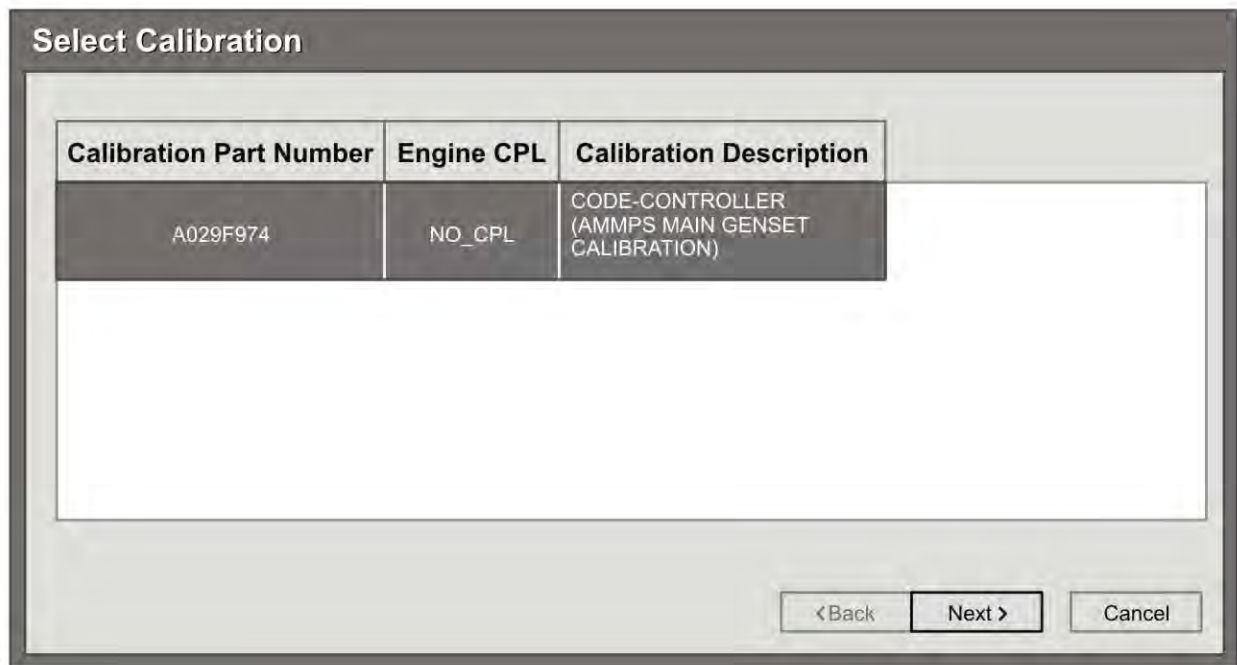


Figure 42. Select Calibration.

### NOTE

Figure 42 is an example of a [Calibration Part Number]. [Calibration Part Number] may vary.

7. Select the appropriate [Calibration Part Number] and select [Next] (Figure 42).

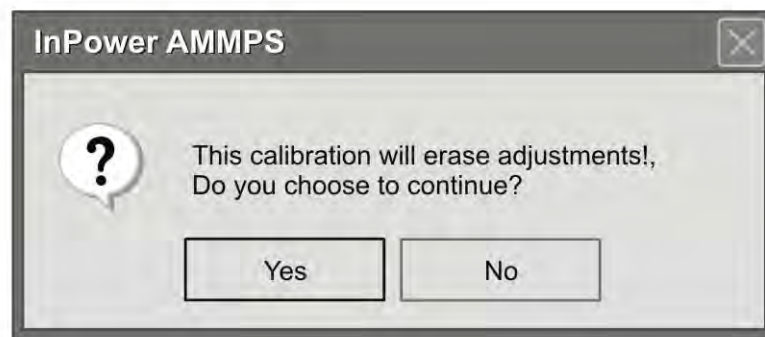


Figure 43. Calibration Erase.

8. Select [YES] if dialog box displays (Figure 43).



### History

Calibration Part Number: A029F974      Current Calibration Revision:

Description: CODE-CONTROLLER (AMMPS MAIN GENSET CALIBRATION)      CD Calibration Revision:

Revision History	Calibration File	Revision Description
14DEC2009	A029F974	History to be updated

Figure 44. History.

9. Choose [Next] if [History] displays the [Calibration File] selected in step 7 (Figure 44).
10. Choose [Back] to select the correct calibration file if [History] displays a calibration file that does not match the [Calibration File] selected in step 7 (Figure 44).

### Save & Restore Parameters

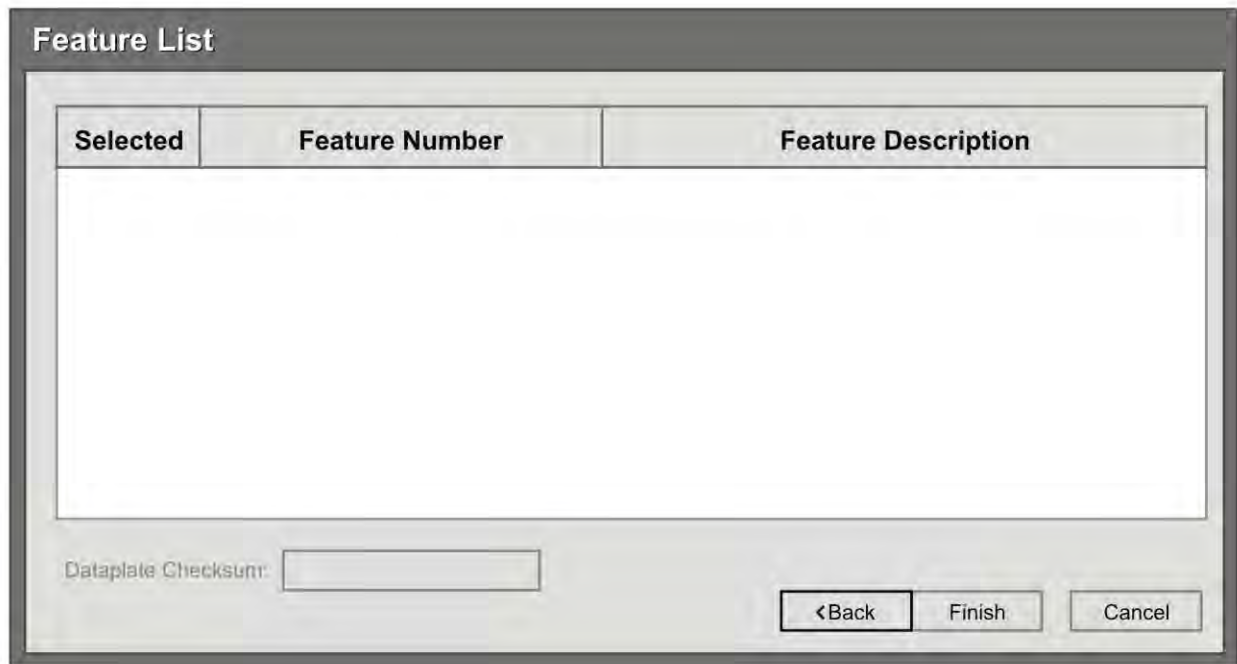
Parameters Loaded From: Connected Device

Parameter Description	Value	Units
Fault History Table	<Data Table>	
Faults Occurrence Table	<Data Table>	

☐ Overlay Capture File After Calibration

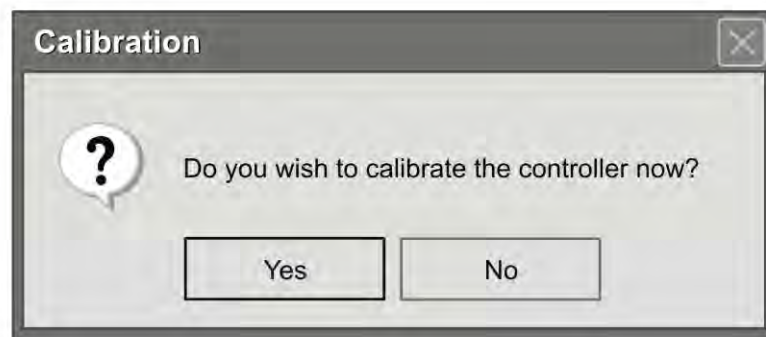
Figure 45. Save and Restore Parameters.

11. Select [Next] after confirming that the correct information is displayed in [Save & Restore Parameters] (Figure 45).



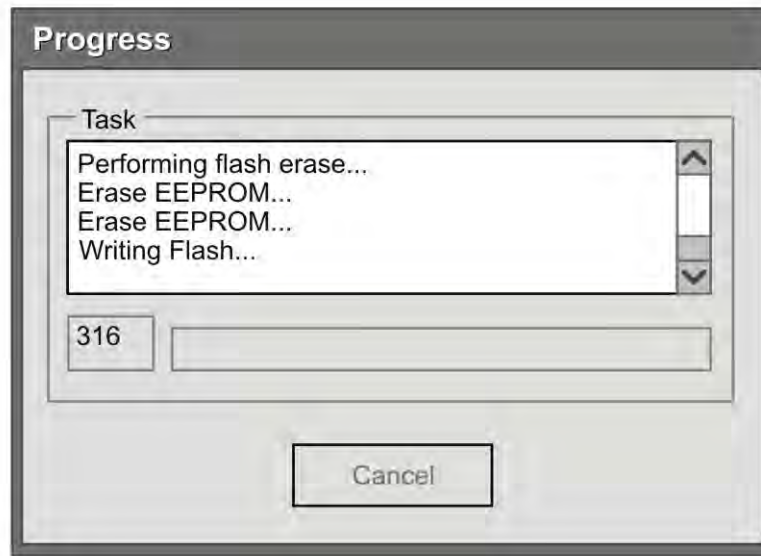
**Figure 46. Feature List Finish.**

12. Select [Finish] when [Feature List] dialog box displays (Figure 46).



**Figure 47. Confirm Calibration.**

13. Select [Yes] after confirming that DCS is ready for calibration (Figure 47).

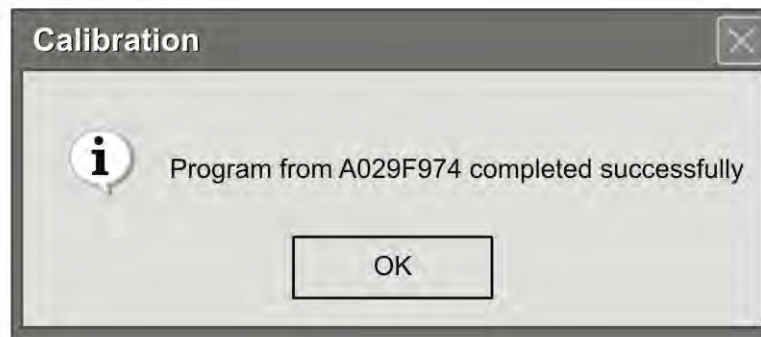


**Figure 48. Calibration Progress.**

### **NOTE**

During the download, it is normal operation for the generator set control to display failure messages (e.g. [System Failure]) and DCS codes. Do not clear DCS codes or perform any other actions during the calibration file download or the download may be interrupted. When the download is complete, a final dialog box (Figure 49) informs the user the download completed successfully.

14. Monitor PC and DCS as calibration is downloaded (Figure 48) to ensure connections are not disturbed and power is not interrupted.



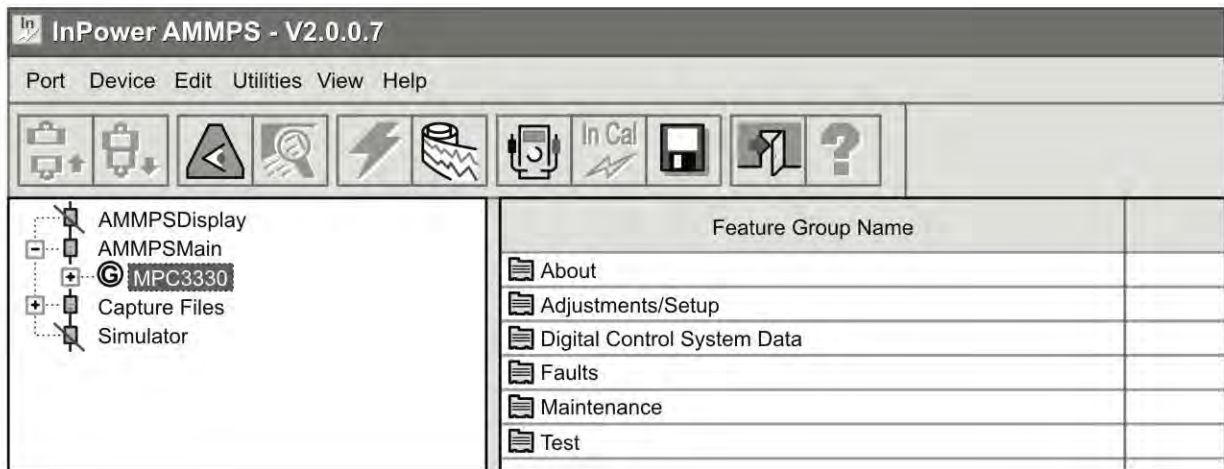
**Figure 49. Calibration Completed Successfully.**



**NOTE**

The calibration file download may take approximately 20 min, depending on PC performance and connection between DCS and P.C. Calibration to the DCS may fail if battery is disconnected during the download process or if the cable drops off accidentally during the download. If DCS LED does not power on and will not power on after turning engine control switch to PRIME & RUN (TM 9-6115-752-10), proceed to Recovering AMMPS DCS if Initial or Update Calibration Fails task. PANEL LIGHTS will still work if calibration is interrupted. If PANEL LIGHTS do not work, proceed to electrical troubleshooting of DCS before attempting recovery of DCS (WP 0009, Electrical System Troubleshooting without a DCS Code).

15. Select [OK] when dialog box indicates [Calibration] has successfully completed (Figure 49).



**Figure 50. DCS Reconnect.**

16. Observe PC screen to confirm InPower AMMPS automatically reconnected to [AMMPSMain] (Figure 50).
17. Overlay capture file and reset engine hours as required. See Using a Capture File to Overlay Data task.
18. Reset parameters as required if capture file is unavailable. See Using a Capture File to Overlay Data task, steps 19 through 26 and step 28.
19. Disconnect from [AMMPSMain] and remove local cable (Figure 10, Item 5) (with MAIN (Figure 10, Item 7) adapter).
20. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
21. Start engine and check for proper operation (TM 9-6115-752-10).
22. Repair as required.

**END OF TASK**

## Using Update Calibration to Install Display Firmware Updates

1. Install battery ground cable (WP 0037, Remove/Install Batteries) and ensure battery power is supplied to the DCS (main DC circuit breaker ON (TM 9-6115-752-10)).

### NOTE

Figure 10 shows a remote cable (Figure 10, Item 4) and a local cable (Figure 10, Item 5). Both cables utilize a RS-485 to RS-232 converter (Figure 10, Item 6). The RS-485 side of the converter plugs into the cable. The RS-232 side plugs into the compatible PC COM Port 1. DISPLAY (Figure 10, Item 8) adapter will be used for step 2.

2. Connect a local cable (Figure 10, Item 5) (with DISPLAY (Figure 10, Item 8) adapter) to the DCS (Figure 10, Item 3) and a compatible PC (Figure 10, Item 1).

### NOTE

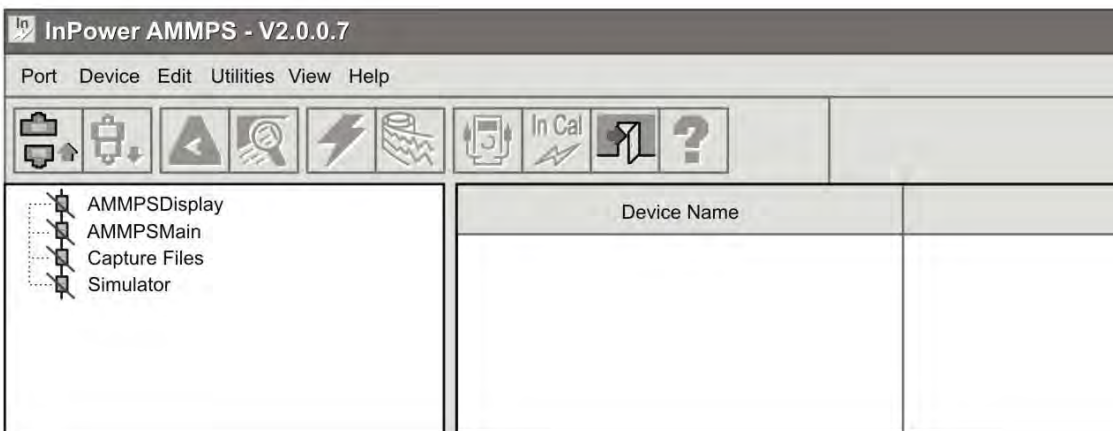
DCS screen will activate upon connection of remote operating cable.

3. Select and open InPower AMMPS icon from desktop or start menu. Install if necessary. See Installing InPower AMMPS to a Compatible PC task.

### NOTE

[Update Calibration] feature is used to download a new display firmware version calibration file into a replacement or current DCS.

4. Select [AMMPSDisplay] from left-side explorer pane (Figure 51).



**Figure 51. Connect to AMMPS Display.**

5. Double-click on [AMMPSDisplay] (Figure 51) or select [Connect] from [Port] drop-down menu (Figure 52).
6. Check the following if InPower fails to connect:
  - a. Ensure COM port for [AMMPSDisplay] is correct and not being used by another device or program. Access [Add Site] from [Port] drop-down menu to change COM port or add a different COM port site.
  - b. Ensure proper RS-485 adapter is being utilized and is installed correctly (Figure 10).
  - c. Ensure battery power is supplied to DCS and DCS is on (step 1).
  - d. Check all cables for proper installation and connections (step 2).

7. Select [HMI400] from left-side explorer pane (Figure 53).
8. Select [Connect] from [Device] drop-down menu (Figure 54).

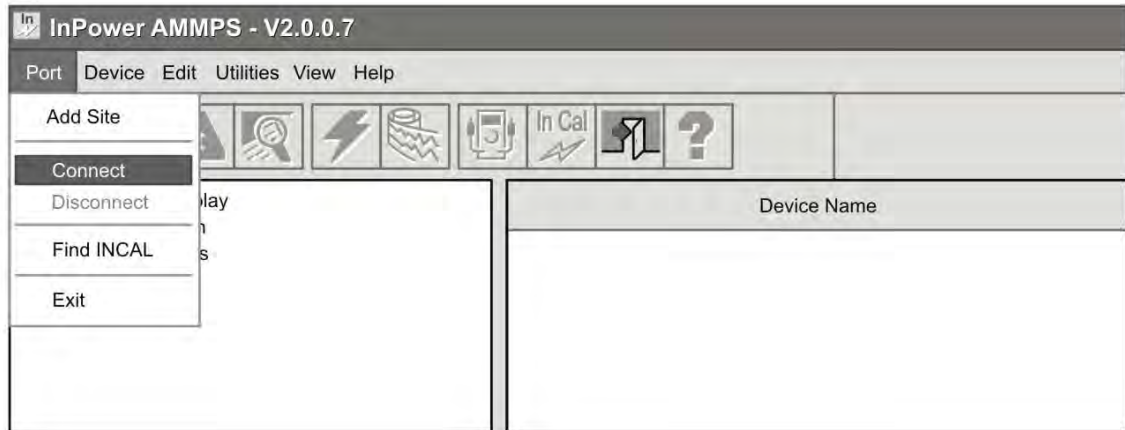


Figure 52. Port for AMMPS Display.

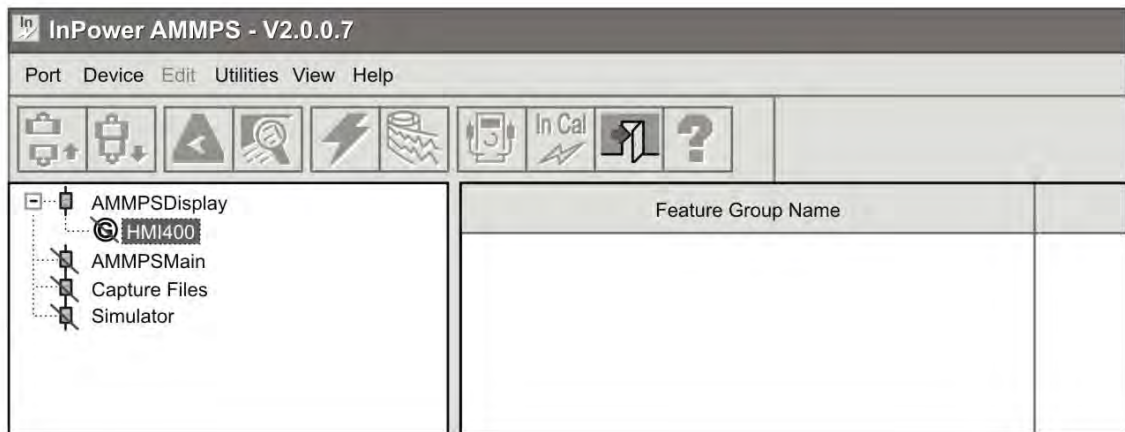


Figure 53. AMMPS Display Device HMI400.

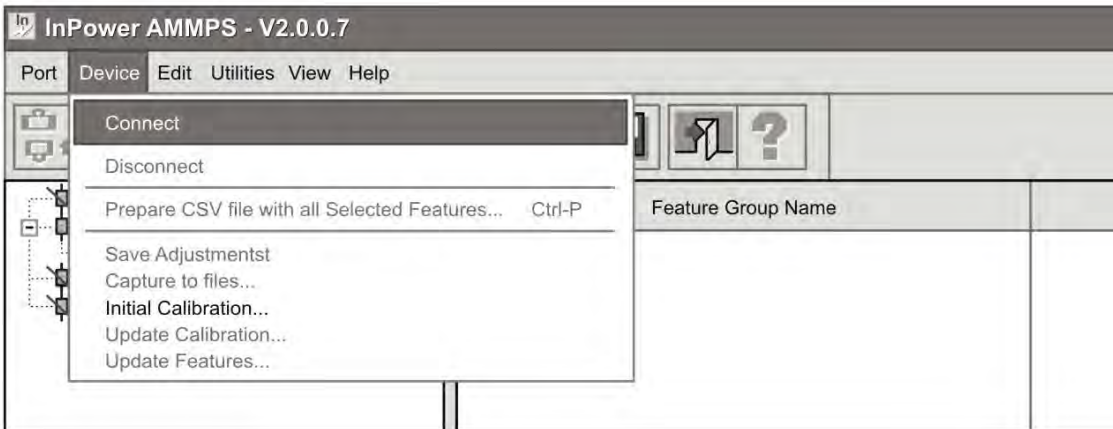


Figure 54. Device Connect Menu for AMMPS Display.

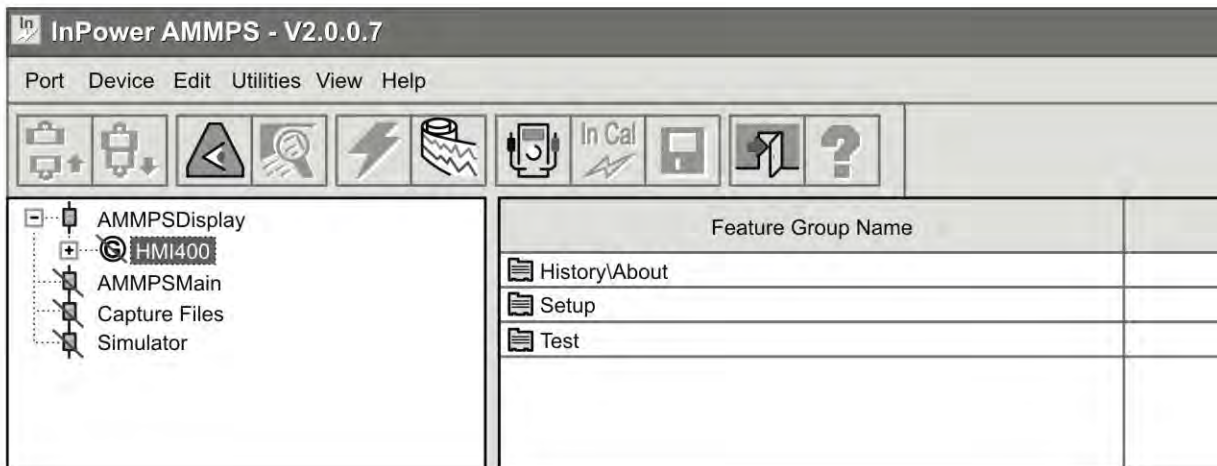
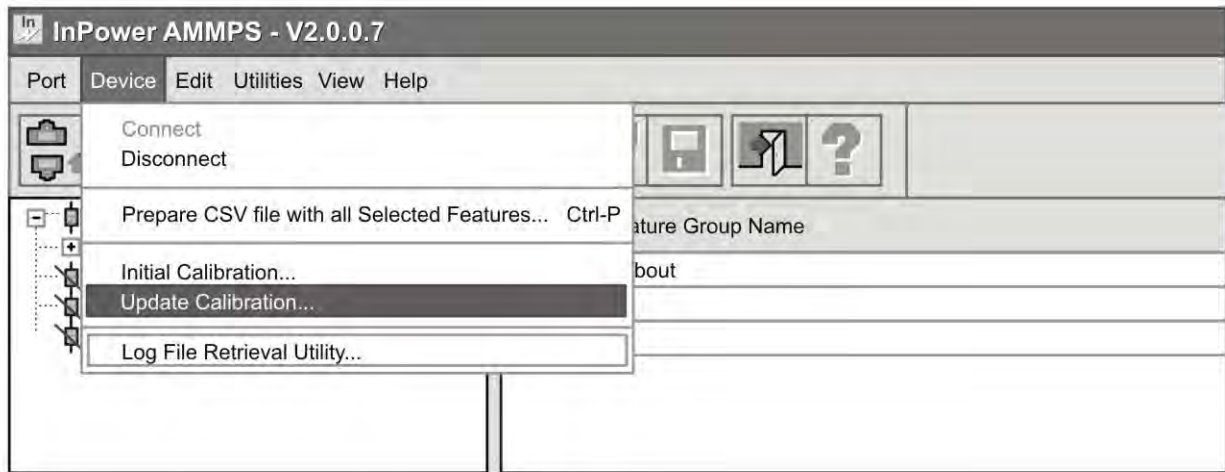


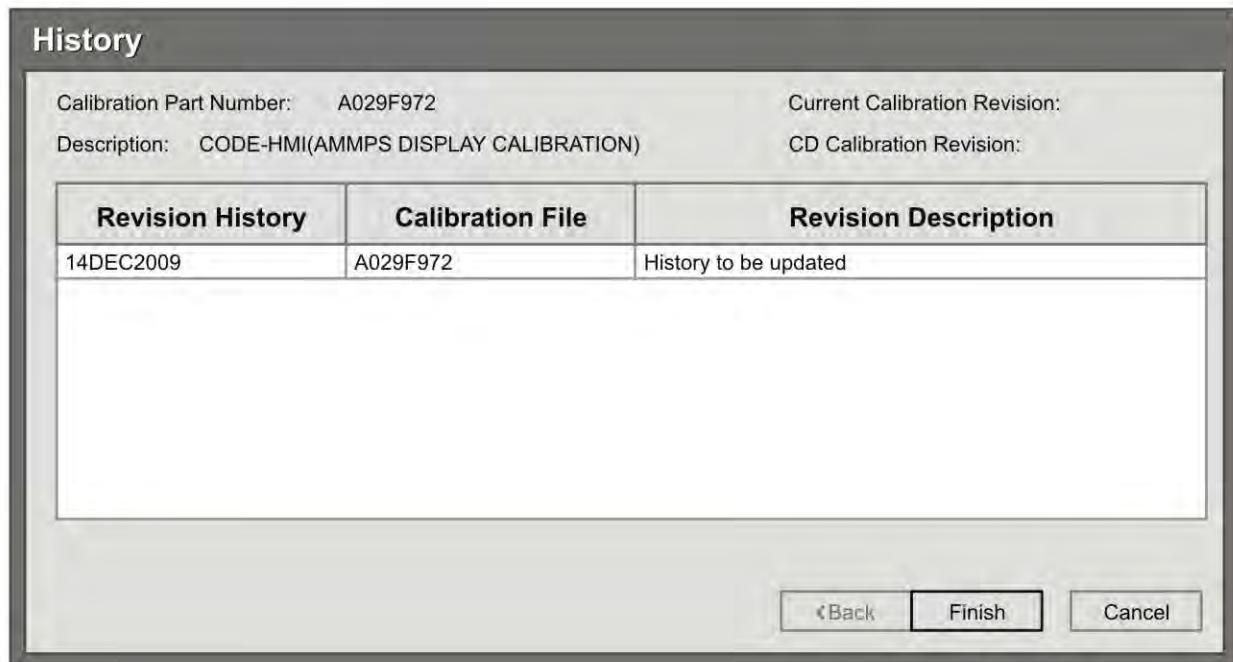
Figure 55. Highlight Display Device.

9. Select [HMI400] from left-side explorer pane once connected (Figure 55).



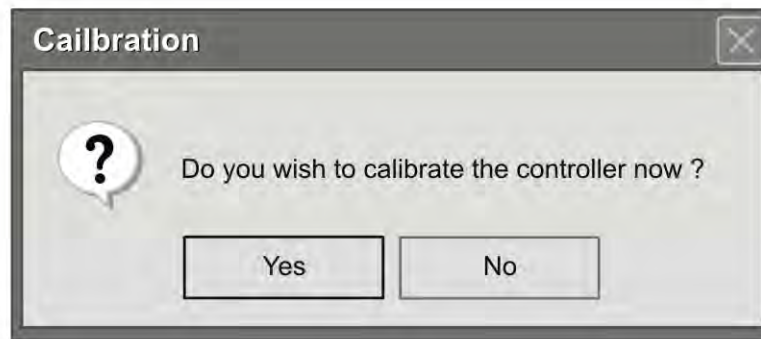
**Figure 56. AMMPS Display Update Calibration.**

10. Select [Update Calibration] from [Device] drop-down menu (Figure 56).
11. Select [Finish] on [History] dialog box (Figure 57).



**Figure 57. AMMPS Display History.**

12. Select [Yes] on [Calibration] dialog box (Figure 58).



**Figure 58. AMMPS Display Dialog Box.**

13. Monitor PC and DCS as calibration is downloaded to ensure connections are not disturbed and power is not interrupted.

### **NOTE**

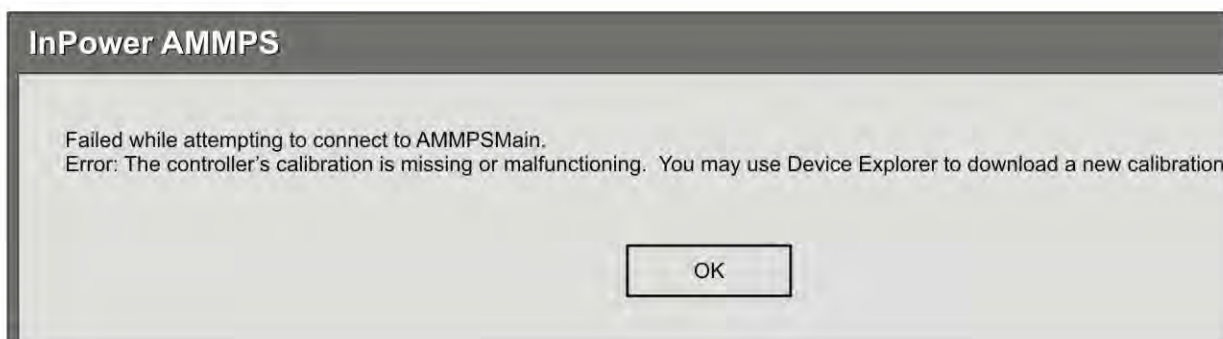
PC will automatically disconnect from DCS when display firmware has been updated. InPower AMMPS will not need to be disconnected from DCS and can be closed.

14. Observe PC screen to confirm InPower AMMPS automatically disconnected from DCS.
15. Access DCS [About] screen to confirm display firmware has been updated (TM 9-6115-752-10).
16. Remove local cable (Figure 10, Item 5) (with DISPLAY (Figure 10, Item 8) adapter).
17. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
18. Start engine and check for proper operation (TM 9-6115-752-10).
19. Repair as required.

### **END OF TASK**

#### **Recovering AMMPS DCS if Initial Calibration Fails**

1. Attempt to connect to [AMMPSMain]. See Using InPower AMMPS on a Compatible PC task.

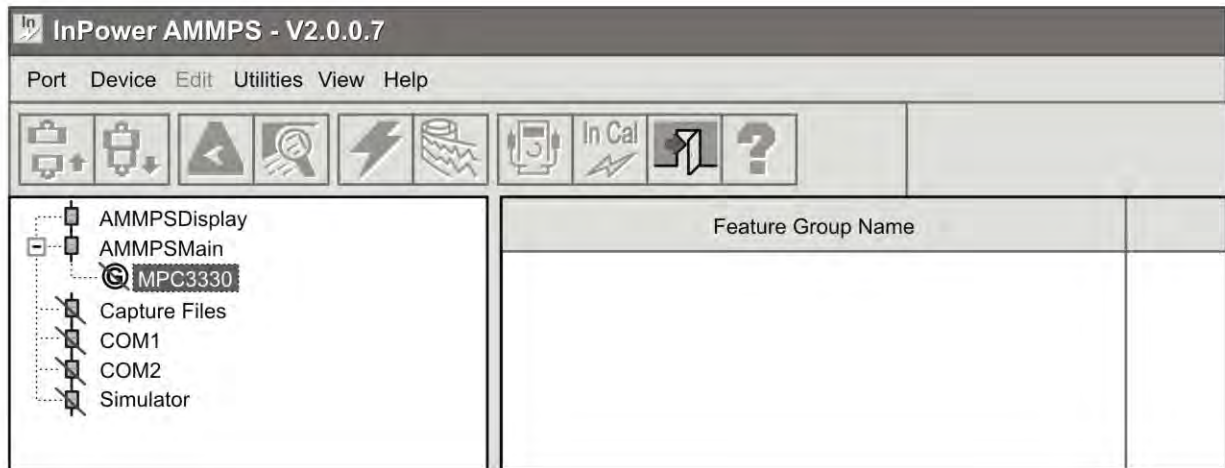


**Figure 59. Failed Connection.**

2. Check PC screen for dialog box indicating failed attempt (Figure 59).



3. Select [OK] and proceed to highlight [AMMPSMain] connection port (Figure 60).



**Figure 60. Highlight.**

4. Proceed to Using Initial Calibration to Install Control Firmware Updates task and complete steps 5 through 22.
5. Test and replace DCS as required if symptom continues (WP 0017, Remove/Install DCS and WP 0018, Repair DCS).

#### **END OF TASK**

#### **Preparation for Storage (Less Than Nine Months)**

#### **NOTE**

Steps 1 through 6 must be completed monthly.

1. Perform operator Before PMCS (TM 9-6115-752-10).
2. Start generator set (TM 9-6115-752-10).
3. Allow generator set to operate until coolant temperature reaches 185°F (85°C).
4. Turn engine control switch OFF (TM 9-6115-752-10).
5. Perform operator After PMCS (TM 9-6115-752-10).
6. Ensure scheduled field maintenance PMCS (WP 0016, Field PMCS) has been performed as required.

#### **END OF TASK**

---

**Preparation for Storage (9 Months to 36 Months)****NOTE**

Read all storage and preservation steps that follow prior to performing them to avoid duplication of steps. Perform steps in order given.

1. Ensure AMMPS 30 kW generator set is fully functional.
  - a. Perform operator Before PMCS (TM 9-6115-752-10).
  - b. Operate generator set at 80% load for 1/2 hr (TM 9-6115-752-10).
  - c. Perform operator After PMCS (TM 9-6115-752-10).
  - d. Verify generator set is fully mission-capable.
    - (1) Repair or replace all defects found while performing PMCS (TM 9-6115-752-10).
    - (2) Repeat substeps 1 a through c.
2. Prepare cooling system for storage.
  - a. Start engine (TM 9-6115-752-10).
  - b. Operate generator set until [Coolant] reaches 180°F (85°C), if necessary.
  - c. Drain coolant (WP 0022, Service Cooling System).
  - d. Clean radiator interior (WP 0022, Service Cooling System).
  - e. Refill cooling system (WP 0022, Service Cooling System) with a mixture of 50% antifreeze and 50% distilled water (WP 0094, Lubrication Instructions).
3. Prepare fuel injection system for storage.
  - a. Fill a suitable 1 gal (4.55 L) or larger container with approved diesel fuel (WP 0094, Lubrication Instructions).
  - b. Fill a suitable 1 gal (4.55 L) or larger container with MIL-PRF-21260E, Grade PEI 0 preservative oil.
  - c. Obtain a suitable 1 gal (4.55 L) or larger empty container.
  - d. Place containers outside of rear door.
  - e. Disconnect the main fuel pump from the fuel manifold (WP 0045, Remove/Install Fuel Pump Main/Auxiliary).
  - f. Connect a suitable flexible fuel line to the main fuel pump.
  - g. Disconnect fuel return line and place into empty container (WP 0046, Remove/Install Fuel Manifold).
  - h. Insert flexible fuel line from substep 3 f into container containing approved diesel fuel.
  - i. Start engine (TM 9-6115-752-10) and operate for 2 min.
  - j. Transfer flexible fuel line from substep 3 f to container of MIL-PRF-21260E, Grade PEI 0 preservative oil.
  - k. Continue to operate engine until preservative oil flows from return line.
  - l. Turn engine control switch to OFF (TM 9-6115-752-10).
  - m. Replace fuel filter/water separator element and spin-on fuel filter element (WP 0048, Replace Fuel Filter/Water Separator Element and WP 0072, Remove/Install Spin-On Fuel Filter Assembly).
  - n. Install main fuel pump (WP 0045, Remove/Install Fuel Pump Main/Auxiliary).
4. Prepare valves, intake system, and cylinders for storage.
  - a. Remove air intake hose at intake manifold (WP 0019, Remove/Install Air Intake Hose Assemblies).



- b. Fill an oil gun with MIL-PRF-21260E, Grade PEI 0 preservative lubricating oil.

### CAUTION

Do not crank engine in excess of 15 sec. Allow starter to cool for at least 15 sec between cranks. Failure to comply may cause damage to equipment.

### NOTE

The DEAD CRANK SWITCH is located on the right-side of the generator set and the intake manifold is located on the left-side of the generator set. An assistant is required to crank the engine while oil is sprayed into the opening of the intake manifold.

- c. Spray oil into opening of intake manifold for 15 sec while cranking the engine using the DEAD CRANK SWITCH (TM 9-6115-752-10).
  - d. Repeat substep 4c for three additional periods of 15 sec each.
  - e. Install air intake hose removed in substep 4a.
5. Prepare lubrication system for storage.
- a. Drain engine oil (WP 0068, Service Lubrication System).
  - b. Replace oil filter (WP 0068, Service Lubrication System).
  - c. Fill engine crankcase (WP 0068, Service Lubrication System) with preservative lubricating oil conforming to grade 10, 30, or 15-40 of MIL-PRF-21260E.
  - d. Crank the engine for 15 sec using the DEAD CRANK SWITCH (TM 9-6115-752-10).
  - e. Repeat substep 5 d for three additional periods of 15 sec each.
6. Prepare 24-V electrical system for storage.
- a. Clean dirt, acid, and other residues from top of batteries.
  - b. Remove batteries from generator set (WP 0037, Remove/Install Batteries).
  - c. Check voltage of the removed batteries (WP 0037, Remove/Install Batteries).

### CAUTION

Charge Absorbed Glass Mat (AGM) batteries only with a device with an AGM setting or that can regulate the voltage between 14.25 V and 14.75 V. Failure to comply will cause damage to equipment.

- d. Charge Absorbed Glass Mat (AGM) batteries as required.
    - (1) When charge level is less than 12.7 V.
    - (2) Charge every six months.
  - e. Charge flooded wet cell batteries as required.
    - (1) When charge level is less than 12.5 V.
    - (2) Charge every three months.
7. Prepare fuel system for storage.
- a. Drain fuel/preservative oil mixture from the fuel supply lines between the fuel filter/water separator and the fuel tank (WP 0044, Service Fuel System).
  - b. Drain fuel tank (WP 0044, Service Fuel System).
  - c. Clean fuel strainers (WP 0044, Service Fuel System).

8. Prepare AC generator for storage.
  - a. Seal end bell vents with tape meeting SAE-AMS-T-22085 standard.
  - b. Seal generator fan screen with tape meeting SAE-AMS-T-22085 standard.
  - c. Seal wire ports in generator housing with tape meeting SAE-AMS-T-22085 standard.
9. Prepare diesel engine for storage.
  - a. Clean dip stick and dip stick tube of dirt and oil and then seal dip stick/dip stick tube junction with tape meeting SAE-AMS-T-22085 standard.
  - b. Clean oil fill of dirt and oil and then seal with tape meeting SAE-AMS-T-22085 standard.
10. Lubricate all doors IAW WP 0094, Lubrication Instructions and close securely.
11. Prepare three warning tags stating "THIS GENERATOR SET HAS BEEN PRESERVED. CHANGE FUEL FILTERS AND ENGINE OIL, AND PERFORM PMCS" and attach to:
  - a. Dip stick
  - b. Oil filler cap.
  - c. Engine control switch.

### CAUTION

Adequate air flow must be provided around generator set when stored under a tent or tarp. Failure to comply will cause damage to equipment.

### NOTE

Store generator set inside an enclosed structure (preferred) or under roof when possible.

When storing generator set outside, cover with a tent or tarp. Allow at least 36 in (0.91 m) space between cover and generator set on all sides to ensure adequate air flow.

12. Move generator set into storage.

### END OF TASK

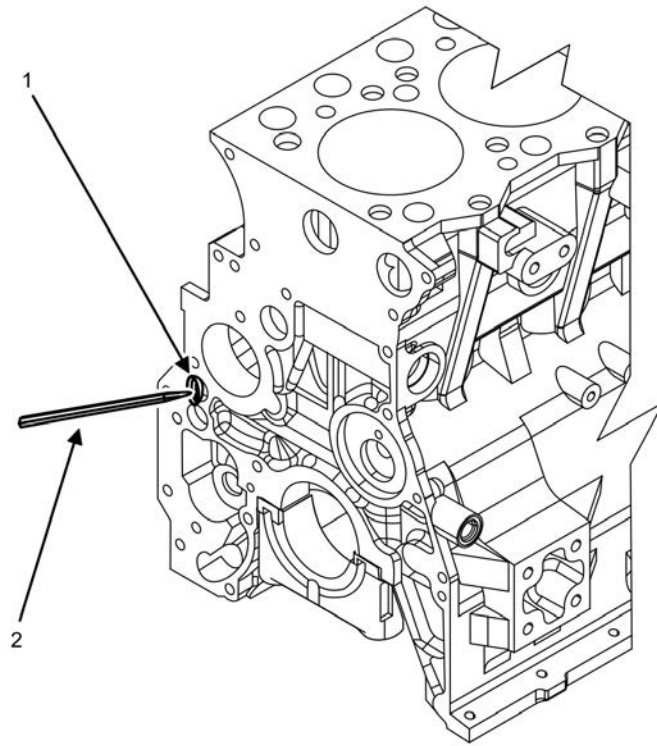
#### Replace Freeze Plug

### NOTE

Several freeze plugs of varying sizes are installed on the engine block. The procedure to replace each freeze plug is the same regardless of size or location.

It is not necessary to remove the engine assembly from the generator set to replace a freeze plug.

1. Drain cooling system (WP 0022, Service Cooling System).
2. Relocate or remove any engine components that restrict access the freeze plug to be replaced. Refer to the relevant WP for the proper procedure to relocate or remove the component.



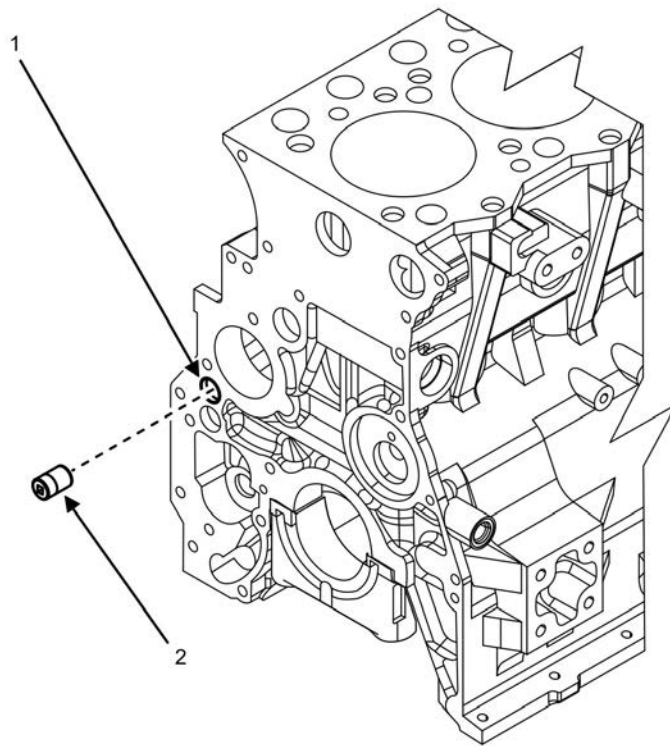
**Figure 61. Remove Freeze Plug.**

3. Place wiping rags under freeze plug (Figure 61, Item 1) to absorb any residual coolant that may spill when freeze plug has been removed.

### **CAUTION**

Use of excessive force with the hammer when removing freeze plug may cause freeze plug to be pushed inside engine block. Use care not to push freeze plug into engine block when removing it. Failure to comply may cause damage to equipment.

4. Remove freeze plug (Figure 61, Item 1) by tapping with a hammer and punch (Figure 61, Item 2) until freeze plug (Figure 61, Item 1) cocks in opening of engine block.
5. Remove and discard freeze plug (Figure 61, Item 1) from opening in engine block.
6. Remove dirt, debris, and oil from opening in engine block by wiping with a rag.
7. Remove any burrs from opening using crocus cloth.



**Figure 62. Install Freeze Plug.**

8. Position new freeze plug (Figure 62, Item 1) to opening in engine block.
9. Tap freeze plug (Figure 62, Item 1) into opening using a hammer and the proper size socket (Figure 62, Item 2) until freeze plug (Figure 62, Item 1) is fully seated into opening of engine block.
10. Replace any engine components previously removed or relocated.
11. Fill the cooling system (WP 0022, Service Cooling System).

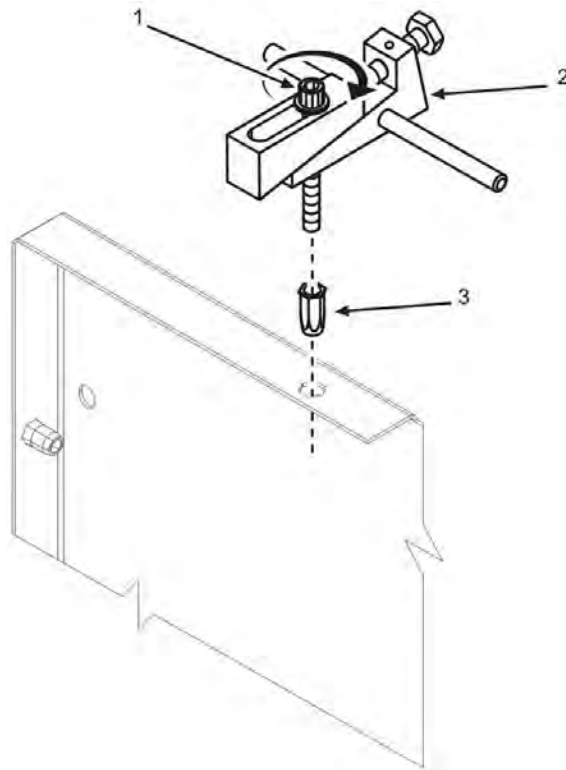
### **WARNING**

Starting engine when unit is partially disassembled is dangerous. Operate engine in this condition only as long as required to test operation. Keep away from unprotected moving engine parts during operation. Failure to comply may cause injury or death to personnel.

12. Set engine control switch to PRIME & RUN (TM 9-6115-752-10).
13. Start engine and run for 5 min (TM 9-6115-752-10).
14. Inspect cooling system (WP 0022, Service Cooling System) for leaks. Repair as required.
15. Stop engine and let cool.
16. Check coolant level in recovery bottle (WP 0022, Service Cooling System) and add coolant as required to bring level of coolant in bottle to LOW marking line.
17. Dispose of spilled coolant and soiled rags IAW local SOP.

**END OF TASK**

## Install Clinch Nut



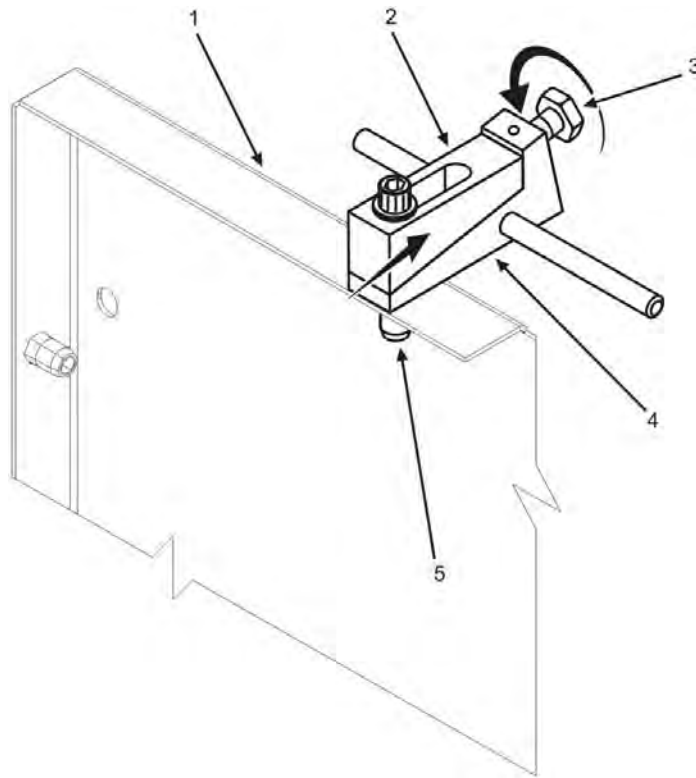
**Figure 63. Clinch Nut to Rivet Tool.**

1. Install new clinch nut (Figure 63, Item 3) to rivet nut tool (Figure 63, Item 2) by turning socket head screw (Figure 63, Item 1) clockwise until clinch nut (Figure 63, Item 3) is fully installed on tool.

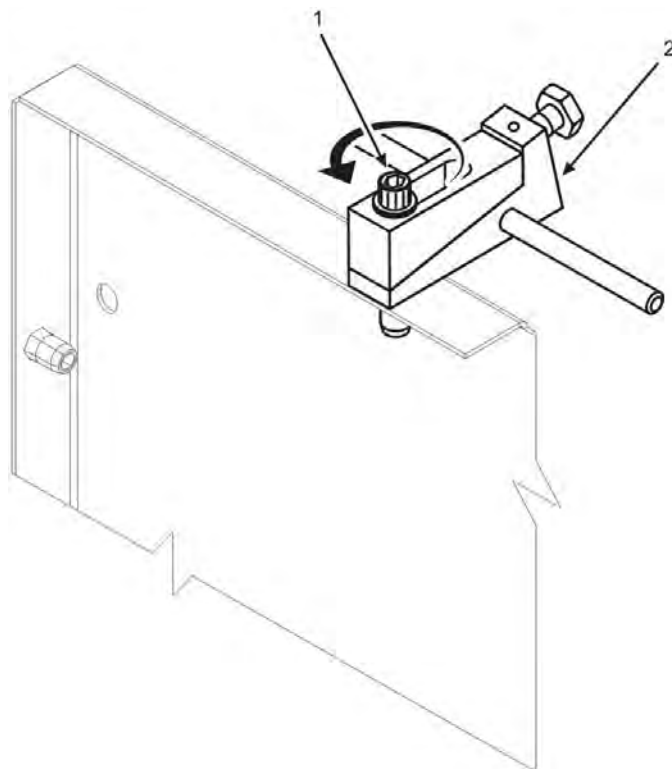
### CAUTION

Prior to tightening hex head screw (Figure 64, Item 3), position rivet nut tool (Figure 63, Item 2) flush with panel surface (Figure 64, Item 1). Failure to comply may result in damage to equipment.

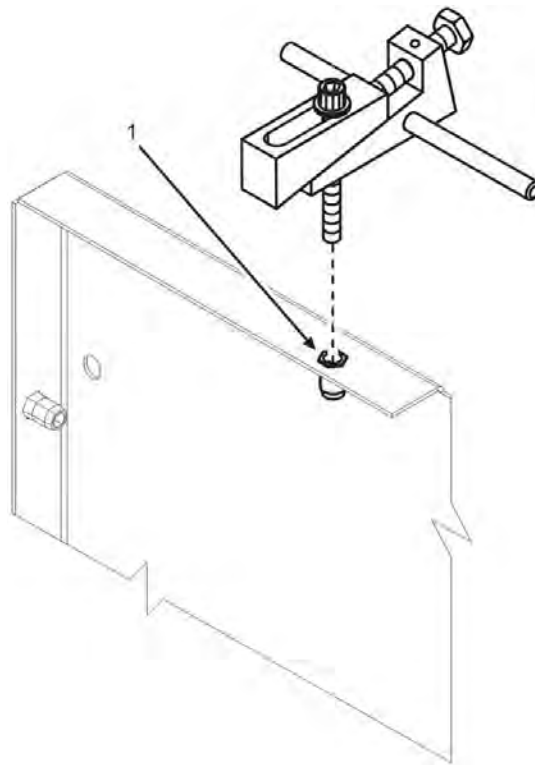
2. Install clinch nut (Figure 64, Item 5) into opening in panel (Figure 64, Item 1) with bottom surface of tool (Figure 64, Item 4) flush with panel (Figure 64, Item 1).
3. Turn hex head screw (Figure 64, Item 3) clockwise to draw top wedge (Figure 64, Item 2) of tool toward hex head screw (Figure 64, Item 3).
4. Continue to tighten hex head screw (Figure 64, Item 3) until top wedge (Figure 64, Item 2) is fully seated on bottom wedge (Figure 64, Item 4) of tool.



**Figure 64. Install Clinch Nut to Panel.**



**Figure 65. Remove Rivet Nut Tool.**



**Figure 66. Installed Clinch Nut.**

5. Turn socket head screw (Figure 65, Item 1) counter-clockwise to remove tool (Figure 65, Item 2) from panel.
6. Use installed clinch nut (Figure 66, Item 1) to secure panel as required.

**END OF TASK**

**END OF WORK PACKAGE**





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**SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL HARMONIC BALANCER**

---

**INITIAL SETUP:****Tools and Special Tools**

Puller Set, Mechanical (WP 0179, Table 2, Item 20)  
Tool Kit, General Mechanic's (GMTK) (WP 0179,  
Table 2, Item 31)

**Materials/Parts**

Screw, hex flange head cap (1) (WP 0166, Repair  
Parts List, Figure 61, Item 5)  
Cleaning compound, solvent (WP 0180, Expendable  
and Durable Items List, Item 11)  
Lubricating oil, engine (WP 0180, Item 25)  
Rag, wiping (WP 0180, Item 33)

**Personnel Required**

91D (1)  
Assistant

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP  
0005)  
Engine cool  
Battery ground cable removed (WP 0037,  
Remove/Install Batteries)  
Front body panel removed (WP 0030,  
Remove/Install Front Body Panel)

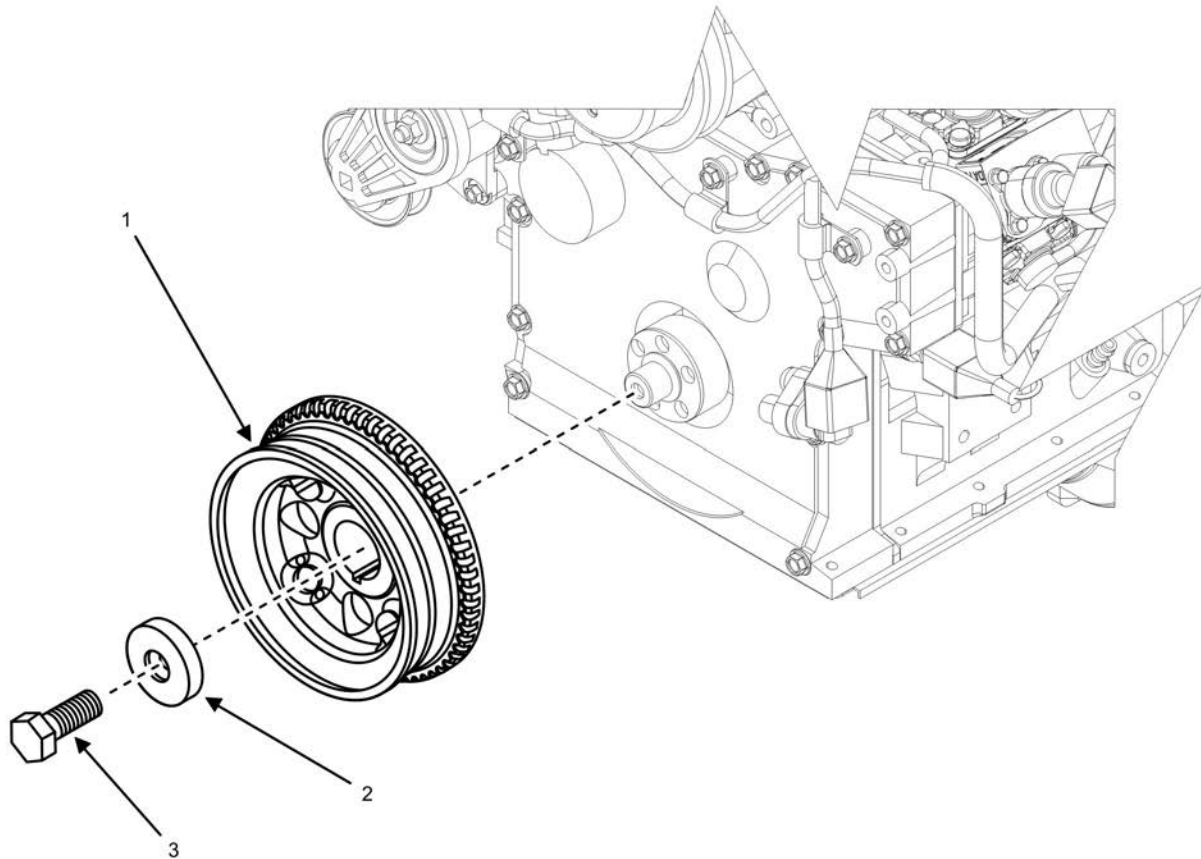
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**REMOVE/INSTALL HARMONIC BALANCER****Remove Harmonic Balancer**

1. Ensure equipment conditions are met in order presented in initial setup.
2. Use assistant to block movement of flywheel.

**NOTE**

Torque specification for harmonic balancer mounting bolt is 274 ft/lb (372 Nm). If harmonic balancer has been previously installed with excessive torque, it may be necessary to apply heat to the harmonic balancer mounting bolt to facilitate removal.



**Figure 1. Harmonic Balancer — Removal.**

3. Remove harmonic balancer mounting bolt (Figure 1, Item 3).
4. Remove mounting plate (Figure 1, Item 2).

**CAUTION**

End of crankshaft where puller jacking screw makes contact is a threaded surface. Take precautions to prevent direct contact of puller jacking screw with end of crankshaft. Failure to comply will cause damage to equipment.

5. Remove harmonic balancer (Figure 1, Item 1) using a puller seated on crankshaft protective device.

**END OF TASK**

---

**Inspect Harmonic Balancer****WARNING**

Cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

1. Clean harmonic balancer (Figure 1, Item 1) with solvent.
2. Dry with wiping rags.
3. Inspect harmonic balancer (Figure 1, Item 1) for wear, excessive wear in belt grooves, or other damage.
4. Inspect mating surface and pulley bore areas for damage.
5. Replace harmonic balancer (Figure 1, Item 1) if damaged or excessively worn.

**END OF TASK****Install Harmonic Balancer**

1. Use assistant to block movement of flywheel.
2. Position harmonic balancer (Figure 1, Item 1) to its mounting location on end of crankshaft.
3. Install mounting plate (Figure 1, Item 2) and harmonic balancer mounting bolt (Figure 1, Item 3) finger-tight.
4. Tighten harmonic balancer mounting bolt (Figure 1, Item 3) to 274 ft/lb (372 Nm) while assistant blocks movement of flywheel.

**END OF TASK****END OF WORK PACKAGE**



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**SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REMOVE/INSTALL GEAR CASE COVER**

---

**INITIAL SETUP:****Tools and Special Tools**

Installer, Crankshaft Seal (WP 0179, Table 2, Item 14)  
Puller Set, Mechanical (WP 0179, Table 2, Item 20)  
Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Cover, front (1) (WP 0164, Repair Parts List, Figure 59, Item 1)  
Seal, oil, (1) (WP 0165, Figure 60, Item 1)  
Cleaning compound, solvent (WP 0180, Expendable and Durable Items List, Item 11)  
Rag, wiping (WP 0180, Item 33)  
Sealant (WP 0180, Item 34)

**Personnel Required**

91D (1)  
Assistant

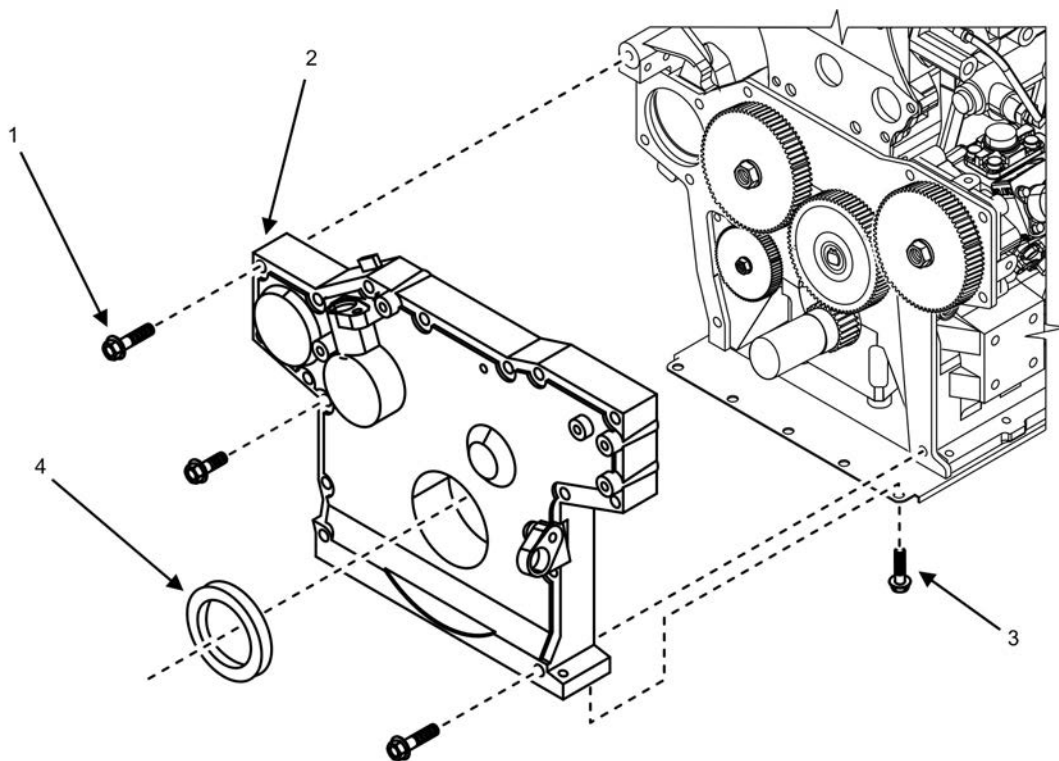
**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)  
Engine cool  
Battery ground cable removed (WP 0037, Remove/Install Batteries)  
Front body panel removed (WP 0030, Remove/Install Front Body Panel)  
Water pump removed (WP 0076, Remove/Install Water Pump)  
Thermostat removed (WP 0077, Remove/Install Thermostat)  
Battery-charging alternator removed (WP 0079, Remove/Install Battery-Charging Alternator)  
Harmonic balancer removed (WP 0101, Remove/Install Harmonic Balancer)

---

**REMOVE/INSTALL GEAR CASE COVER****Remove Gear Case Cover**

1. Ensure equipment conditions are met in order presented in initial setup.



**Figure 1. Front Gear Case Cover — Removal.**

### **NOTE**

Cap screws (Figure 1, Items 1 and 3) that secure front gear case (Figure 1, Item 2) to engine are of different lengths at different locations. Record the length and location of cap screws (Figure 1, Item 1 and 3) as they are removed from front gear case (Figure 1, Item 2).

2. Remove 17 cap screws (Figure 1, Item 1) and 5 cap screws (Figure 1, Item 3) securing front gear case cover (Figure 1, Item 2) to engine.
3. Remove front gear case cover (Figure 1, Item 2) and place on a suitable work surface.
4. Remove and discard front crankshaft oil seal (Figure 1, Item 4) from front gear case cover (Figure 1, Item 2).

### **CAUTION**

Do not allow debris from sealant material to enter engine. Failure to comply will cause damage to the unit.

5. Remove any residual sealant material from mating surfaces of engine and front gear case cover (Figure 1, Item 2).

**END OF TASK**

---

**Inspect Gear Case Cover****WARNING**

Cleaning solvent is combustible and toxic to eyes, skin, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply may cause injury or death to personnel.

1. Clean front gear case cover (Figure 1, Item 2) and engine mounting surface with solvent to remove any trace of residual solvent.

**WARNING**

Eye protection is required when working with compressed air. Do not use compressed air to clean skin. Do not aim at personnel. Compressed air can propel particles at high velocity and injure eyes. Failure to comply may cause injury or death to personnel.

2. Dry front gear case cover (Figure 1, Item 2) with compressed air.
3. Inspect front gear case cover (Figure 1, Item 2) for cracks and other damage.
4. Replace front gear case cover (Figure 1, Item 2) if cracked or otherwise damaged.

**END OF TASK****Install Gear Case Cover****CAUTION**

Use caution when aligning and installing gear case cover. Excessive force to the seal lip surface may cause damage to the seal. Failure to comply may cause damage to engine.

1. Fill cavity in front crankshaft oil seal (Figure 1, Item 4) to 40 – 60% full capacity with multi-purpose grease.
2. Install front crankshaft oil seal (Figure 1, Item 4) into front gear case cover (Figure 1, Item 2) using seal installer.
3. Apply gasket sealant to rear of gear case cover (Figure 1, Item 2).
4. Apply a coat of clean engine oil to inner surface of front crankshaft oil seal (Figure 1, Item 4).
5. Place front gear case cover (Figure 1, Item 2) in position on engine and align mounting holes, being careful not to damage edge of front crankshaft oil seal (Figure 1, Item 4).
6. Secure front gear case cover (Figure 1, Item 2) to engine by installing 17 cap screws (Figure 1, Item 1) and 5 cap screws (Figure 1, Item 3).
7. Torque 17 cap screws (Figure 1, Item 1) and 5 cap screws (Figure 1, Item 3) to 14 ft/lb (19 Nm).
8. Install harmonic balancer (WP 0101, Remove/Install Harmonic Balancer).
9. Install battery-charging alternator (WP 0079, Remove/Install Battery-Charging Alternator).
10. Install thermostat (WP 0077, Remove/Install Thermostat).
11. Install water pump (WP 0076, Remove/Install Water Pump).

**END OF TASK****END OF WORK PACKAGE**





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**SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REPLACE CYLINDER HEAD GASKET**

---

**INITIAL SETUP:****Test Equipment**

Adapter, Compression Tester (WP 0179, Table 2, Item 1)  
 Tester, Cylinder Compression (WP 0179, Table 2, Item 26)

**Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0179, Table 2, Item 31)

**Materials/Parts**

Gasket, cylinder head (WP 0157, Repair Parts List, Figure 52, Item 10)  
 Gasket, exhaust manifold (1) (WP 0151, Repair Parts List, Figure 46, Item 2)  
 Gasket, injector (WP 0140, Repair Parts List, Figure 35, Item 4)  
 Gasket, oil drain (1) (WP 0141, Repair Parts List, Figure 36, Item 8)  
 Gasket, turbocharger to exhaust manifold (1) (WP 0141, Figure 36, Item 3)  
 Gasket, valve cover (3) (WP 0158, Repair Parts List, Figure 53, Item 4)  
 Screw, hex flange head cap (17) (WP 0157, Figure 52, Item 11)  
 Seal, dust (WP 0140, Figure 35, Item 3)  
 Seal, O-ring (3) (WP 0158, Figure 53, Item 4)  
 Washer, sealing (2) (WP 0143, Repair Parts List, Figure 38, Item 24)  
 Washer, sealing (M14) (7) (WP 0143, Figure 38, Item 17)  
 Compound, antiseize (WP 0180, Expendable and Durable Items List, Item 14)  
 Lubricating oil, engine (WP 0180, Item 25)  
 Rag, wiping (WP 0180, Item 33)

**Personnel Required**

91D (1)  
 Assistant

**References**

WP 0029, Remove/Install Top Body Panel  
 WP 0044, Service Fuel System  
 WP 0066, Remove/Install 50/60 Hz Engine Assembly  
 WP 0067, Remove/Install 400 Hz Engine Assembly  
 WP 0074, Test/Replace Fuel Injector  
 WP 0090, Check/Adjust Valves

**Equipment Conditions**

Engine control switch OFF (TM 9-6115-752-10, WP 0005)  
 Engine cool  
 Battery ground cable removed (WP 0037, Remove/Install Batteries)  
 Top body panel removed (WP 0029, Remove/Install Top Body Panel)  
 Front body panel removed (WP 0030, Remove/Install Front Body Panel)  
 Fuel injectors and lines removed (WP 0074, Test/Replace Fuel Injector)  
 Fuel rail and fuel drain lines removed (WP 0073, Remove/Install Fuel Rail and WP 0075, Remove/Install High-Pressure Fuel Pump)  
 Turbocharger removed (WP 0085, Remove/Install Turbocharger)  
 Exhaust manifold removed (WP 0086, Remove/Install Exhaust Manifold)  
 Valve cover removed (WP 0089, Remove/Install Valve Cover)

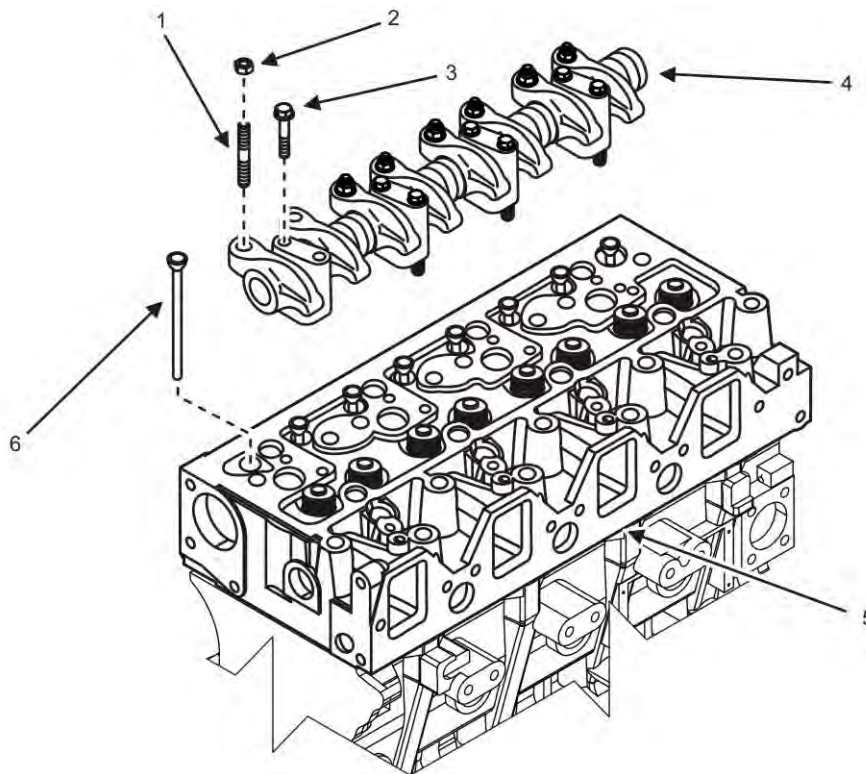
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**INITIAL SETUP — CONTINUED:**

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**REPLACE CYLINDER HEAD GASKET****WARNING**

- Comply with all lifting requirements. Observe the decals on equipment and parts that identify the weight and determine if assistance is needed. Maximum lift is 37 lb (16.8 kg) for one person, 74 lb (33.6 kg) for two persons, and 101 lb (45.8 kg) for three persons. Failure to comply may cause injury or death to personnel.
- The component being lifted weighs 50 lb (23 kg). Two personnel or a suitable lifting device are necessary to lift component. Failure to comply may cause injury or death to personnel.

**Replace Cylinder Head Gasket**

**Figure 1. Rocker Arm and Push Rod — Removal.**

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**NOTE**

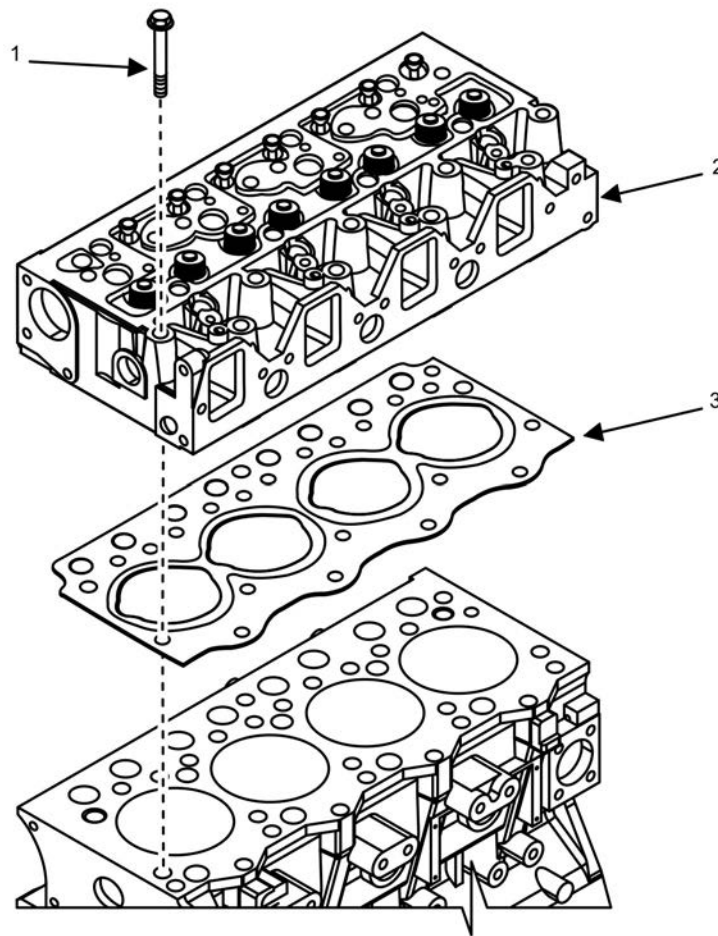
Several of the rocker arms (Figure 1, Item 4) will be under spring tension prior to removal. It is important to release the spring tension on the rocker arms (Figure 1, Item 4) before loosening the eight mounting bolts (Figure 1, Item 3). If tension is not released, push rods (Figure 1, Item 6) and rocker arms (Figure 1, Item 4) may be damaged during removal. If eight push rods (Figure 1, Item 6) are removed from the engine for reuse, they must be marked so they can be returned to their original location upon assembly.

1. Ensure equipment conditions are met in order presented in initial setup.
2. Loosen locking nut (Figure 1, Item 2) on rocker arm adjusting screw (Figure 1, Item 1).
3. Turn rocker arm adjusting screw (Figure 1, Item 1) counterclockwise two to three turns to release spring tension on rocker arm (Figure 1, Item 4).
4. Repeat steps 2 and 3 to release spring tension on all eight rocker arms (Figure 1, Item 4) before continuing with removal procedure.
5. Remove eight mounting bolts (Figure 1, Item 3) securing rocker arms (Figure 1, Item 4) to cylinder head (Figure 1, Item 5).
6. Remove rocker arm assembly (Figure 1, Item 4) from cylinder head (Figure 1, Item 5) and place on a suitable work surface.

**NOTE**

If eight push rods (Figure 1, Item 6) are to be reused at installation, it is important that they be returned to their original position in the engine block. Mark the location of each push rod (Figure 1, Item 6) as it is removed from the engine.

7. Remove eight push rods (Figure 1, Item 6) from engine and place on a suitable work surface.



**Figure 2. Cylinder Head Assembly — Removal.**

8. Remove 17 cylinder head mounting bolts (Figure 2, Item 1) that secure cylinder head assembly (Figure 2, Item 2) to engine block.
9. Discard all removed cylinder head mounting bolts (Figure 2, Item 1).
10. Remove cylinder head assembly (Figure 2, Item 2) from engine block and place on a suitable work surface.
11. Remove and discard cylinder head gasket (Figure 2, Item 3) from engine block.

**END OF TASK**

**Inspect Cylinder Head Assembly and Gasket**

1. Inspect cylinder head assembly (Figure 2, Item 2) for warps, cracks, and obvious damage.
2. Replace cylinder head assembly (Figure 2, Item 2) if warped, cracked, or damaged.

**END OF TASK**

## Install Cylinder Head Gasket

### CAUTION

Remove all carbon, dirt, debris, and burrs from contact surfaces of engine block and cylinder head assembly. Failure to comply will cause damage to equipment.

1. Position new cylinder head gasket (Figure 2, Item 3) to engine block with TOP mark facing up and align mounting holes.
2. Position cylinder head assembly (Figure 2, Item 2) and cylinder head gasket (Figure 2, Item 3) to mounting location on engine block and align mounting holes.
3. Apply anti-seize compound to threads of 17 new cylinder head mounting bolts (Figure 2, Item 1).
4. Install 17 new cylinder head mounting bolts (Figure 2, Item 1) finger-tight to secure cylinder head assembly (Figure 2, Item 2) onto engine.

### CAUTION

Torque cylinder head mounting bolts in the sequence shown in Figure 3. Torque the bolts in three steps to ensure even tightening and a complete seal between the cylinder head and engine block. Failure to comply will cause damage to equipment.

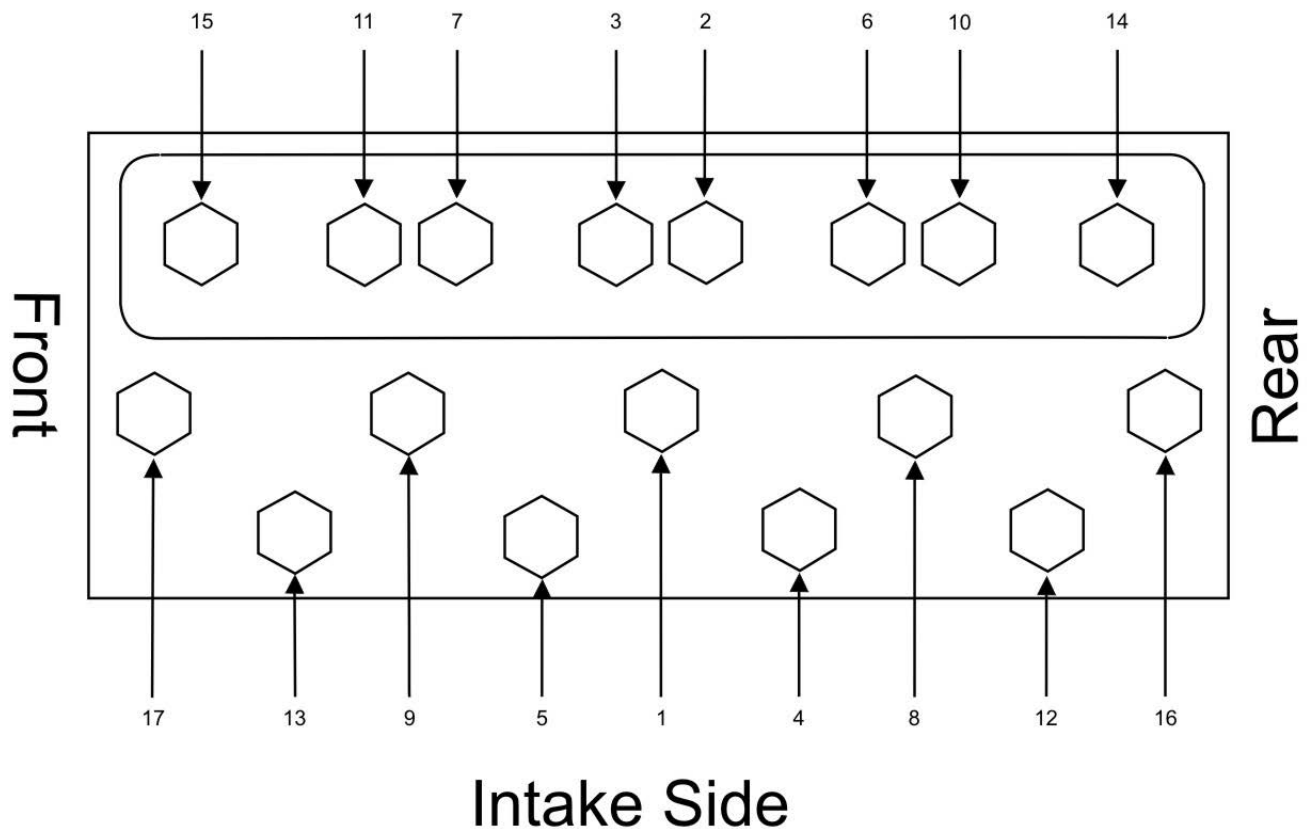


Figure 3. Head Bolt — Tightening Sequence.

5. Torque 17 cylinder head mounting bolts (Figure 2, Item 1) in sequence shown in Figure 3 to 51 ft/lb (69 Nm).
6. Torque 17 cylinder head mounting bolts (Figure 2, Item 1) in sequence shown in Figure 3 to 80 ft/lb (108 Nm).
7. Tighten 17 cylinder head mounting bolts (Figure 2, Item 1) in sequence shown in Figure 3 an additional 90 degrees clockwise.
8. Install push rods (Figure 1, Item 6) into engine block using markings applied during removal to ensure push rods are returned to original positions. Ensure that socket of push rods (Figure 1, Item 6) is facing rocker arms (Figure 1, Item 4).
9. Position rocker arms (Figure 1, Item 4) to its mounting location on engine and secure by installing eight mounting bolts (Figure 1, Item 3).
10. Check to ensure ball of rocker arm adjusting screw (Figure 1, Item 1) is properly seated into socket of push rod (Figure 1, Item 6) at each valve location before tightening mounting bolts (Figure 1, Item 3).
11. Loosen rocker arm adjusting screws (Figure 1, Item 1) if spring tension is encountered when installing rocker arms (Figure 1, Item 4).
12. Tighten mounting bolts (Figure 1, Item 3) finger-tight on middle rocker arm pedestal (Figure 2, Item 4) first.
13. Tighten remaining rocker arm mounting bolts (Figure 1, Item 3) finger-tight.
14. Torque middle rocker arm mounting bolts (Figure 1, Item 3) to 18 ft/lb (25 Nm).
15. Torque remaining rocker arm mounting bolts (Figure 1, Item 3) to 18 ft/lb (25 Nm), working from inside-out.
16. Adjust all valves (WP 0090, Check/Adjust Valves).
17. Install valve cover (WP 0089, Remove/Install Valve Cover).
18. Install exhaust manifold (WP 0086, Remove/Install Exhaust Manifold).
19. Install turbocharger (WP 0085, Remove/Install Turbocharger).
20. Install fuel rail and fuel drain lines (WP 0073, Remove/Install Fuel Rail and WP 0075, Remove/Install High-Pressure Fuel Pump).
21. Install fuel injectors and lines (WP 0074, Test/Replace Fuel Injector).
22. Install front body panel (WP 0030, Remove/Install Front Body Panel).
23. Install top body panel (WP 0029, Remove/Install Top Body Panel).
24. Install battery ground cable (WP 0037, Remove/Install Batteries).
25. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
26. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
27. Repair as required.

## END OF TASK

### Test Engine Compression

#### NOTE

Intake and exhaust valves must be adjusted to specification prior to testing engine compression (WP 0090, Check/Adjust Valves). Batteries must be fully charged prior to testing engine compression. Engine compression measurements must be made while the engine is at a minimum temperature of 122°F (50°C).

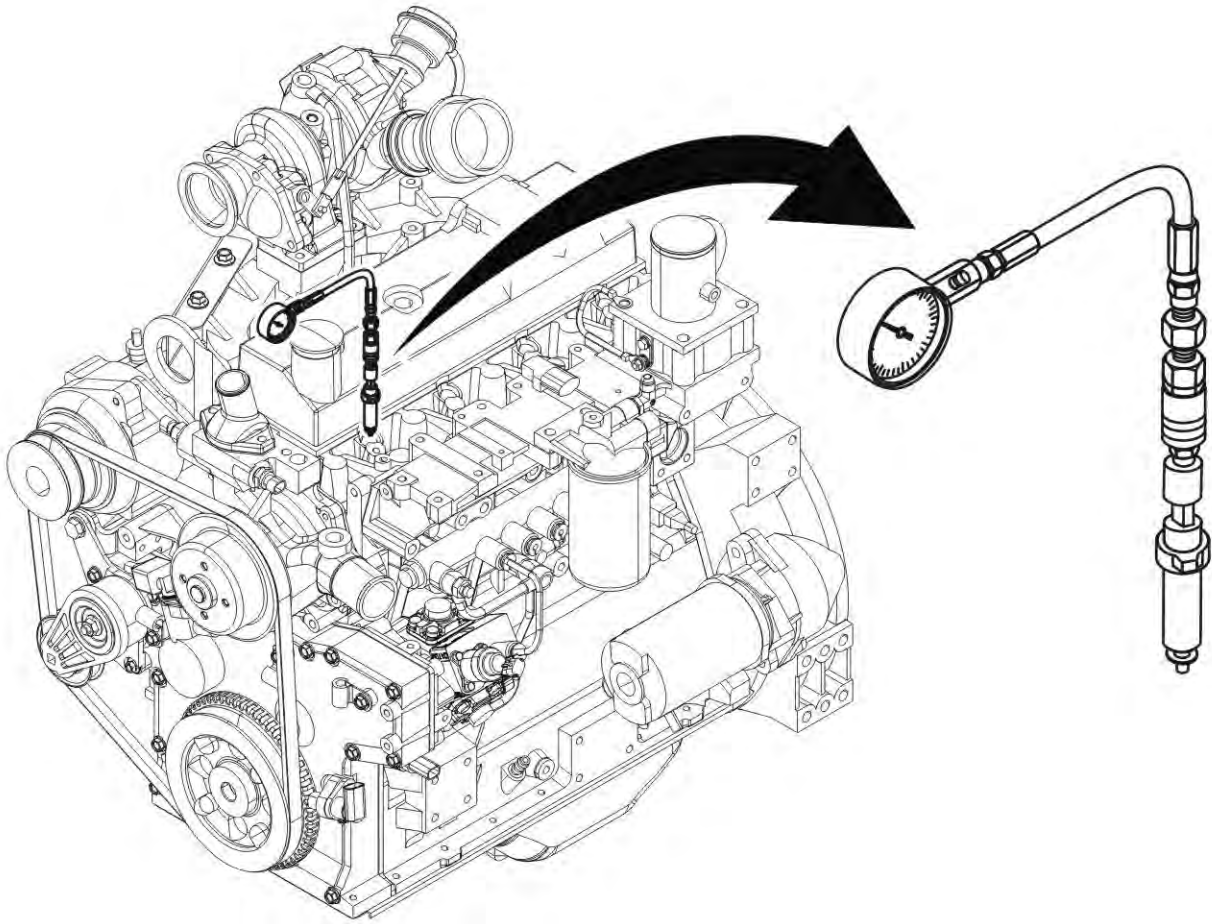
1. Adjust valves (WP 0090, Check/Adjust Valves).
2. Start engine and run until it reaches normal operating temperature (TM 9-6115-752-10).

3. Turn engine control switch to OFF (TM 9-6115-752-10).

### WARNING

Top and some housing panels can get very hot. Allow panels to cool down before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply may cause injury or death to personnel.

4. Remove battery ground cable (WP 0037, Remove/Install Batteries).
5. Remove top body panel (WP 0029, Remove/Install Top Body Panel).



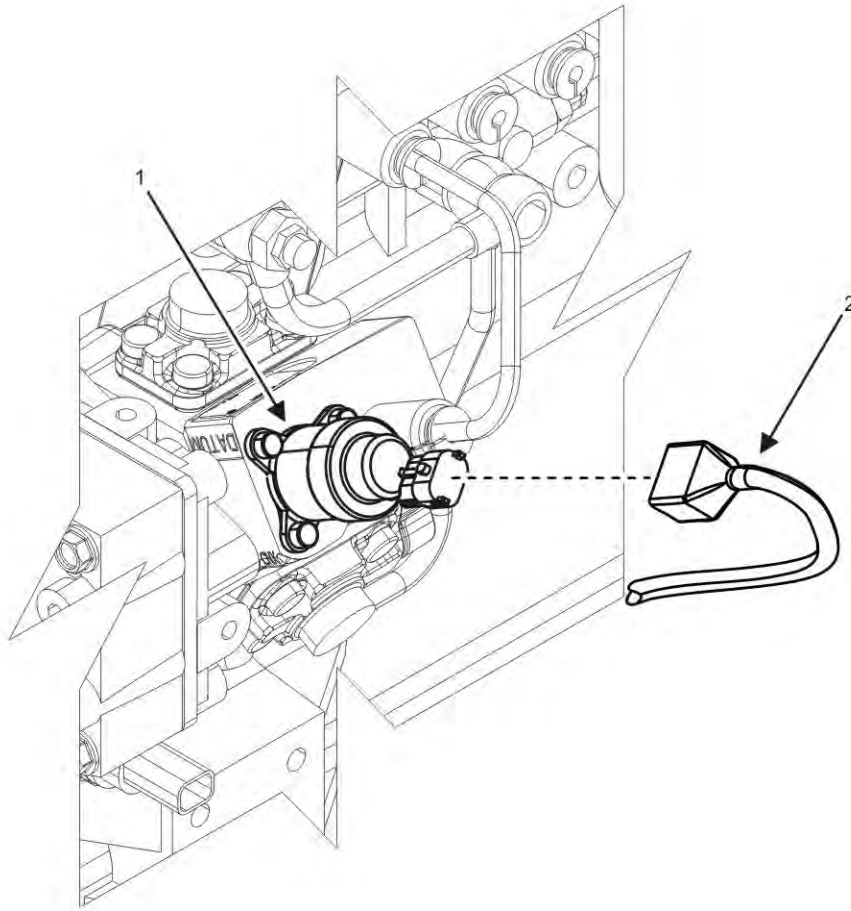
**Figure 4. Compression Adapter in Fuel Injector Hole — Location.**

6. Remove fuel injector lines, fuel drain line, and fuel injectors (WP 0074, Test/Replace Fuel Injector).

### NOTE

Disconnecting the high-pressure fuel pump actuator connector (Figure 5, Item 2) prevents the high-pressure fuel pump from injecting fuel during compression testing.

7. Remove high-pressure fuel pump actuator connector (Figure 5, Item 2) from the actuator (Figure 5, Item 1).
8. Install battery ground cable (WP 0037, Remove/Install Batteries).
9. Locate fuel injector hole for compression adapter installation (Figure 4).



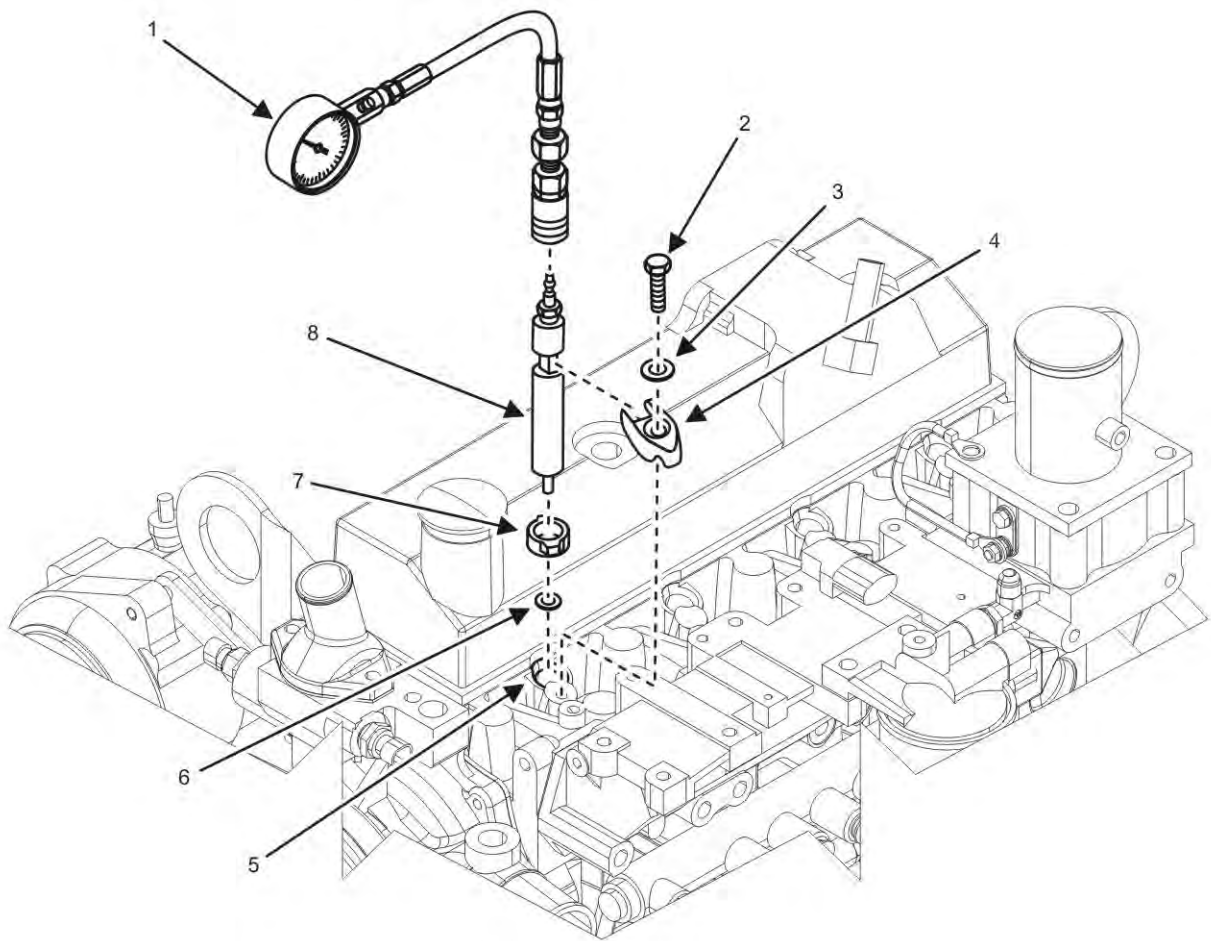
**Figure 5. High-Pressure Fuel Pump Actuator Connector — Removal.**

**NOTE**

Compression is tested in each of the four cylinders.

10. Crank engine for a few seconds using the dead crank switch (TM 9-6115-752-10) to clear cylinders of any residual fuel.





**Figure 6. Compression Adapter — Installation.**

11. Install compression gage adapter (Figure 6, Item 8), dust seal (Figure 6, Item 7), gasket (Figure 6, Item 6), and compression gage (Figure 6, Item 1) into fuel injector hole (Figure 6, Item 5) at cylinder one. Install screw (Figure 6, Item 2), washer (Figure 6, Item 3), and fuel injector clamp (Figure 6, Item 4).
12. Crank engine through four compression cycles using dead crank switch (TM 9-6115-752-10) until compression gage (Figure 6, Item 1) reading is stabilized.
13. Record compression reading on compression gage (Figure 6, Item 1).

### CAUTION

Release pressure in compression gage (Figure 6, Item 1) using release button after each use before removing compression gage (Figure 6, Item 1). Failure to comply will cause damage to equipment.

14. Remove screw (Figure 6, Item 2), washer (Figure 6, Item 3), fuel injector clamp (Figure 6, Item 4), compression gage adapter (Figure 6, Item 8), and compression gage (Figure 6, Item 1) from cylinder one.
15. Repeat steps 11 through 14 for cylinders two, three, and four.

---

**NOTE**

Lowest allowable compression limit is 427 psi (29.4 bar). Compression pressure readings between cylinders should not vary more than 10 percent when compared cylinder to cylinder.

16. Replace engine if compression pressure is below allowable limit of 427 psi (29.4 bar) in any cylinder (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).
17. Compare compression pressure readings between cylinders and replace engine if compression pressures vary between cylinders by more than approximately 42 psi (2.9 bar) (WP 0066, Remove/Install 50/60 Hz Engine Assembly or WP 0067, Remove/Install 400 Hz Engine Assembly).
18. Remove battery ground cable (WP 0037, Remove/Install Batteries).
19. Install fuel injector lines, fuel drain line, and fuel injectors (WP 0074, Test/Replace Fuel Injector).
20. Install high-pressure fuel pump actuator connector (Figure 5, Item 2) to actuator (Figure 5, Item 1).
21. Install top panel (WP 0029, Remove/Install Top Body Panel).
22. Install battery ground cable (WP 0037, Remove/Install Batteries).
23. Purge air from fuel system (WP 0044, Service Fuel System).
24. Turn engine control switch to PRIME & RUN (TM 9-6115-752-10).
25. Start engine and check for proper operation. Bring coolant to normal operating temperature and then apply a 100% rated load for 30 min (TM 9-6115-752-10).
26. Repair as required.

**END OF TASK**

**END OF WORK PACKAGE**

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**SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
WIRING DIAGRAMS**

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**INITIAL SETUP:****Personnel Required**

91D (1)

**References**

NMWR 9-6115-752

**References**

FO-1, Wiring Diagram

FO-2, Schematic Diagram

FO-3, Wiring Diagram, Electronic Control Module (ECM)

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**INTRODUCTION**

All diagrams and essential wiring information are provided for all electrical circuits with the exception of the DCS. The wiring diagram for the DCS is provided in NMWR 9-6115-752.

**WIRE IDENTIFICATION**

Identification of wires is done in the FO-1, Wiring Diagram; FO-2, Schematic Diagram; and FO-3, Wiring Diagram, Electronic Control Module (ECM) in the Rear Matter of this manual.

**ABBREVIATIONS**

Abbreviations in the wiring information conform to ASME Y14.38 unless the wires are marked as shown in the respective diagrams.

**WIRING DIAGRAMS**

Wiring schematics and diagrams are provided in the FO-1, Wiring Diagram; FO-2, Schematic Diagram; and FO-3, Wiring Diagram, Electronic Control Module (ECM) located in the Rear Matter of this manual.

**END OF WORK PACKAGE**



**CHAPTER 6**  
**PARTS INFORMATION**  
**FOR**  
**AMMPS 30KW GENERATOR SET**

CHAPTER 6

PARTS INFORMATION

WORK PACKAGE INDEX

<u>Title</u>	<u>WP Sequence No.</u>
RPSTL INTRODUCTION .....	0105
GENERATOR SET REPAIR PARTS LIST .....	0106
DC ELECTRIC INSTALLATION REPAIR PARTS LIST .....	0107
RELAY PANEL ASSEMBLY REPAIR PARTS LIST .....	0108
HOUSING INSTALLATION REPAIR PARTS LIST .....	0109
DCS INSTALLATION REPAIR PARTS LIST .....	0110
DCS CONTROL PANEL ASSEMBLY REPAIR PARTS LIST .....	0111
DCS ENCLOSURE ASSEMBLY REPAIR PARTS LIST .....	0112
INTAKE AIR INSTALLATION REPAIR PARTS LIST .....	0113
EXHAUST INSTALLATION REPAIR PARTS LIST .....	0114
COOLING SYSTEM INSTALLATION REPAIR PARTS LIST .....	0115
FUEL SYSTEM INSTALLATION REPAIR PARTS LIST .....	0116
FUEL MANIFOLD ASSEMBLY REPAIR PARTS LIST .....	0117
FUEL FILTER/WATER SEPARATOR INSTALLATION REPAIR PARTS LIST .....	0118
FUEL COOLER INSTALLATION REPAIR PARTS LIST .....	0119
OUTPUT BOX INSTALLATION REPAIR PARTS LIST .....	0120
CONTACTOR REPAIR PARTS LIST .....	0121
OUTPUT TERMINAL BOARD REPAIR PARTS LIST .....	0122
VOLTAGE SELECTION BOARD REPAIR PARTS LIST .....	0123
HOUR METER REPAIR PARTS LIST .....	0124
CONVENIENCE RECEPTACLE REPAIR PARTS LIST .....	0125
TRANSFORMERS REPAIR PARTS LIST .....	0126
PRINTED CIRCUIT BOARD MODULE REPAIR PARTS LIST .....	0127
POWER PLANT INSTALLATION REPAIR PARTS LIST .....	0128
AC GENERATOR ASSEMBLY, 50/60 HZ REPAIR PARTS LIST .....	0129
ROTOR ASSEMBLY, 50/60 HZ REPAIR PARTS LIST .....	0130
RECTIFIER ASSEMBLY, 50/60 HZ REPAIR PARTS LIST .....	0131
AC GENERATOR ASSEMBLY, 400 HZ REPAIR PARTS LIST .....	0132
ROTOR ASSEMBLY, 400 HZ REPAIR PARTS LIST .....	0133
RECTIFIER ASSEMBLY, 400 HZ REPAIR PARTS LIST .....	0134
ENGINE ASSEMBLY REPAIR PARTS LIST .....	0135
LUBRICATION SYSTEM REPAIR PARTS LIST .....	0136
ENGINE OIL DRAIN HOSE ASSEMBLY REPAIR PARTS LIST .....	0137

<b><u>Title</u></b>	<b><u>WP Sequence No.</u></b>
OIL COOLER REPAIR PARTS LIST .....	0138
COALESCER REPAIR PARTS LIST .....	0139
FUEL INJECTOR REPAIR PARTS LIST .....	0140
TURBOCHARGER REPAIR PARTS LIST .....	0141
HIGH-PRESSURE FUEL PUMP REPAIR PARTS LIST .....	0142
FUEL RAIL AND FUEL LINES REPAIR PARTS LIST .....	0143
SPIN-ON FUEL FILTER REPAIR PARTS LIST .....	0144
THERMOSTAT REPAIR PARTS LIST .....	0145
WATER PUMP REPAIR PARTS LIST .....	0146
BATTERY-CHARGING ALTERNATOR AND BELT REPAIR PARTS LIST .....	0147
STARTER REPAIR PARTS LIST .....	0148
INTAKE AIR HEATER REPAIR PARTS LIST .....	0149
INTAKE MANIFOLD REPAIR PARTS LIST .....	0150
EXHAUST MANIFOLD REPAIR PARTS LIST .....	0151
OIL PAN AND STRAINER REPAIR PARTS LIST .....	0152
BELT TENSIONER AND IDLER PULLEY REPAIR PARTS LIST .....	0153
ENGINE ECM REPAIR PARTS LIST .....	0154
ENGINE ECM WIRING HARNESS REPAIR PARTS LIST .....	0155
ENGINE ECM SENSORS REPAIR PARTS LIST .....	0156
CYLINDER HEAD ASSEMBLY REPAIR PARTS LIST .....	0157
VALVE COVER REPAIR PARTS LIST .....	0158
ROCKER ARMS AND PUSH RODS REPAIR PARTS LIST .....	0159
SHORT BLOCK ASSEMBLY REPAIR PARTS LIST .....	0160
CONNECTING RODS REPAIR PARTS LIST .....	0161
PISTONS REPAIR PARTS LIST .....	0162
CRANKSHAFT AND CRANKSHAFT GEAR REPAIR PARTS LIST .....	0163
FRONT GEAR CASE COVER REPAIR PARTS LIST .....	0164
FRONT CRANKSHAFT OIL SEAL REPAIR PARTS LIST .....	0165
CRANKSHAFT PULLEY REPAIR PARTS LIST .....	0166
CAMSHAFT AND GEAR REPAIR PARTS LIST .....	0167
OIL PUMP REPAIR PARTS LIST .....	0168
FLYWHEEL AND FLYWHEEL HOUSING REPAIR PARTS LIST .....	0169
ENGINE WIRING HARNESS REPAIR PARTS LIST .....	0170
POWER WIRING HARNESS REPAIR PARTS LIST .....	0171
WINTERIZATION KIT INSTALLATION REPAIR PARTS LIST .....	0172

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<u>Title</u>	<u>WP Sequence No.</u>
BULK ITEM .....	0173
SPECIAL TOOLS LIST .....	0174
NATIONAL STOCK NUMBER (NSN) INDEX .....	0175
PART NUMBER INDEX .....	0176



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**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**RPSTL INTRODUCTION**

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## **INTRODUCTION**

### **SCOPE**

This RPSTL lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of operator and field maintenance of the AMMPS 30 kW generator set. It authorizes the requisitioning, issue, and disposition of spares, repair parts, and special tools as indicated by the source, maintenance, and recoverability (SMR) codes.

### **GENERAL**

In addition to the Introduction work package, this RPSTL is divided into the following work packages.

1. **Repair Parts List Work Packages.** Work packages containing lists of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. These work packages also include parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Sending units, brackets, filters, and bolts are listed with the component they mount on. Bulk materials are listed by item name in FIG. BULK at the end of the work packages. Repair parts kits are listed separately in their own functional group and work package. Repair parts for reparable special tools are also listed in a separate work package. Items listed are shown on the associated illustrations.
2. **Special Tools List Work Packages.** Work packages containing lists of special tools, special TMDE, and special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in the DESCRIPTION AND USABLE ON CODE (UOC) column). Tools that are components of common tool sets and/or Class VII are not listed.
3. **Cross-Reference Indexes Work Packages.** There are two cross reference indexes work packages in this RPSTL: the National Stock Number (NSN) Index work package and the Part Number (P/N) Index work package. The National Stock Number (NSN) Index work package refers you to the figure and item number. The Part Number (P/N) Index work package refers you to the figure and item number.

### **EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIALTOOLS LIST WPS**

ITEM NO. (Column (1)). Indicates the number used to identify items called out in the illustration.

SMR CODE (Column (2)). The SMR code containing supply/requisitioning information, maintenance level authorization criteria, and disposition instruction, as shown in the following breakout. This entry may be subdivided into four subentries, one for each service.

Table 1. SMR Code Explanation.

<b>Source Code <u>XX</u></b>	<b>Maintenance Code <u>XX</u></b>	<b>Recoverability Code <u>X</u></b>
1st two positions: How to get an item.	3rd position: Who can install, replace, or use the item.	4th position: Who can do complete repair* on the item.
		5th position: Who determines the disposition action on unserviceable items.

\*Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

Source Code. The source code tells you how you get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follow:

<b><u>Source Code</u></b>	<b><u>Application/Explanation</u></b>
---------------------------	---------------------------------------

PA  
PB  
PC  
PD  
PE  
PF  
PG  
PH  
PR  
PZ

**NOTE**

Items coded PC are subject to deterioration.

Stock items; use the applicable NSN to requisition/request items with these source codes. They are authorized to the level indicated by the code entered in the third position of the SMR code.

KD  
KF  
KB

Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance level indicated in the third position of the SMR code. The complete kit must be requisitioned and applied.

MF-Made at field level  
MH-Made at below depot/sustainment level  
ML-Made at SRA  
MD-Made at depot  
MG-Navy only

Items with these codes are not to be requisitioned/requested individually. They must be made from bulk material which is identified by P/N in the DESCRIPTION AND UOC column and listed in the bulk material group work package of the RPSTL. If the item is authorized to you by the third position code of the SMR code, but the source indicates it is made at a higher level, order the item from the higher level of maintenance.

AF-Assembled by field level  
AH-Assembled by below depot/sustainment level  
AL-Assembled by SRA  
AD-Assembled by depot  
AG-Navy only

Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated in the source code. If the third position of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.

XA

Do not requisition an "XA" coded item. Order the next higher assembly. (Refer to NOTE below.)

XB

If an item is not available from salvage, order it using the CAGEC and part number.

XC

Installation drawings, diagrams, instruction sheets, field service drawings; identified by manufacturer's part number.

**Source Code****Application/Explanation**

XD

Item is not stocked. Order an XD-coded item through local purchase or normal supply channels using the CAGEC and part number given, if no NSN is available.

**NOTE**

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes except for those items source coded "XA" or those aircraft support items restricted by requirements of AR 750-1.

Maintenance Code. Maintenance codes tell you the level(s) of maintenance authorized to use and repair support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:

Third Position. The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to the following levels of maintenance:

**Maintenance****Code****Application/Explanation**

C -

Crew.

F -

Field maintenance can remove, replace, and use the item.

H -

Below Depot Sustainment maintenance can remove, replace, and use the item.

L -

Specialized repair activity can remove, replace, and use the item.

G -

Afloat and ashore intermediate maintenance can remove, replace, and use the item (Navy only).

K -

Contractor facility can remove, replace, and use the item.

Z -

Item is not authorized to be removed, replaced, or used at any maintenance level.

D -

Depot can remove, replace, and use the item.

\*NOTE - Army will use C in the third position. However, for joint service publications, other services may use O.

Fourth Position. The maintenance code entered in the fourth position tells you whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (perform all authorized repair functions).

**NOTE**

Some limited repair may be done on the item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.

**Maintenance****Code****Application/Explanation**

C -

Crew (Operator) is the lowest class that can do complete repair.

F -

Field is the lowest level that can do complete repair of the item.

H -

Below Depot Sustainment is the lowest level that can do complete repair of the item.

L -

Specialized repair activity (*enter specialized repair activity or TASMG designator*) is the lowest level that can do complete repair of the item.

D -

Depot is the lowest level that can do complete repair of the item.

G -

Both afloat and ashore intermediate levels are capable of complete repair of item. (Navy only).

K -

Complete repair is done at contractor facility.

- Z - Nonreparable. No repair is authorized.
- B - No repair is authorized. No parts or special tools are authorized for maintenance of "B" coded item. However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

Recoverability Code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is shown in the fifth position of the SMR code as follows:

<b><u>Recoverability Code</u></b>	<b><u>Application/Explanation</u></b>
Z -	Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in the third position of the SMR code.
F -	Reparable item. When uneconomically reparable, condemn and dispose of the item at the field level.
H -	Reparable item. When uneconomically reparable, condemn and dispose of the item at the below depot sustainment level.
D -	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item are not authorized below depot level.
L -	Reparable item. Condemnation and disposal not authorized below Specialized Repair Activity (SRA).
A -	Item requires special handling or condemnation procedures because of specific reasons (such as precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.
G -	Field level reparable item. Condemn and dispose at either afloat or ashore intermediate levels. (Navy only).
K -	Reparable item. Condemnation and disposal to be performed at contractor facility.

NSN (Column (3)). The NSN for the item is listed in this column.

CAGEC (Column (4)). The Commercial and Government Entity Code (CAGEC) is a five-digit code which is used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.

PART NUMBER (Column (5)). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

## NOTE

When you use an NSN to requisition an item, the item you receive may have a different part number from the number listed.

DESCRIPTION AND UOC (Column (6)). This column includes the following information:

1. The federal item name and, when required, a minimum description to identify the item.
2. Part numbers of bulk materials are referenced in this column in the line entry to be manufactured or fabricated.
3. Hardness Critical Item (HCI). A support item that provides the equipment with special protection from electromagnetic pulse (EMP) damage during a nuclear attack.
4. The statement END OF FIGURE appears just below the last item description in column (6) for a given figure in both the repair parts list and special tools list work packages.

QTY (Column (7)). The QTY (quantity per figure) column indicates the quantity of the item used in the breakout shown on the illustration/figure, which is prepared for a functional group, sub-functional group, or an assembly. A "V" appearing in this column instead of a quantity indicates that the quantity is variable and quantity may change from application to application.

USMC QTY per Equip (Column (8)). This column accommodates the Marine Corps quantity per equipment requirement.

## EXPLANATION OF CROSS-REFERENCE INDEXES WORK PACKAGES FORMAT AND COLUMNS

1. National Stock Number (NSN) Index Work Package. NSNs in this index are listed in National Item Identification Number (NIIN) sequence.

STOCK NUMBER Column. This column lists the NSN in NIIN sequence. The NIIN consists of the last nine digits of the NSN. When using this column to locate an item, ignore the first four digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

For example, if the NSN is 5385-01-574-1476, the NIIN is 01-574-1476.

FIG. Column. This column lists the number of the figure where the item is identified/located. The figures are in numerical order in the repair parts list and special tools list work packages.

ITEM Column. The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

2. Part Number (P/N) Index work package. Part numbers in this index are listed in ascending alphanumeric sequence (vertical arrangement of letter and number combinations which places the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9 and each following letter or digit in like order).

PART NUMBER Column. Indicates the part number assigned to the item.

FIG. Column. This column lists the number of the figure where the item is identified/located in the repair parts list and special tools list work packages.

ITEM Column. The item number is the number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

## SPECIAL INFORMATION

UOC. The UOC appears in the lower left corner of the Description Column heading. Usable on codes are shown as "UOC:..." in the Description Column (justified left) on the first line under the applicable item/nomenclature. Uncoded items are applicable to all models. Identification of the UOCs used in the RPSTL are:

<u>Code</u>	<u>Used On</u>
98L	Model MEP 1060
98M	Model MEP 1061

Fabrication Instructions. Bulk materials required to manufacture items are listed in the bulk material functional group of this RPSTL. Part numbers for bulk material are also referenced in the Description Column of the line item entry for the item to be manufactured/fabricated. Detailed fabrication instructions for items source coded to be manufactured or fabricated are found in applicable TM.

Index Numbers. Items which have the word BULK in the figure column will have an index number shown in the item number column. This index number is a cross-reference between the NSN / Part Number (P/N) Index work packages and the bulk material list in the repair parts list work package.

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## HOW TO LOCATE REPAIR PARTS

### 1. When NSNs or Part Numbers Are Not Known.

First. Using the Table of Contents, determine the assembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and lists are divided into the same groups.

Second. Find the figure covering the functional group or the subfunctional group to which the item belongs.

Third. Identify the item on the figure and note the number(s).

Fourth. Look in the repair parts list work package for the figure and item numbers. The NSNs and part numbers are on the same line as the associated item numbers.

### 2. When NSN Is Known.

First. If you have the NSN, look in the STOCK NUMBER column of the NSN Index work package. The NSN is arranged in NIIN sequence. Note the figure and item number next to the NSN.

Second. Turn to the figure and locate the item number. Verify that the item is the one you are looking for.

### 3. When Part Number Is Known.

First. If you have the part number and not the NSN, look in the PART NUMBER column of the part number index WP. Identify the figure and item number.

Second. Look up the item on the figure in the applicable repair parts list work package.

## ABBREVIATIONS

Not applicable.

## END OF WORK PACKAGE

FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
GENERATOR SET REPAIR PARTS LIST

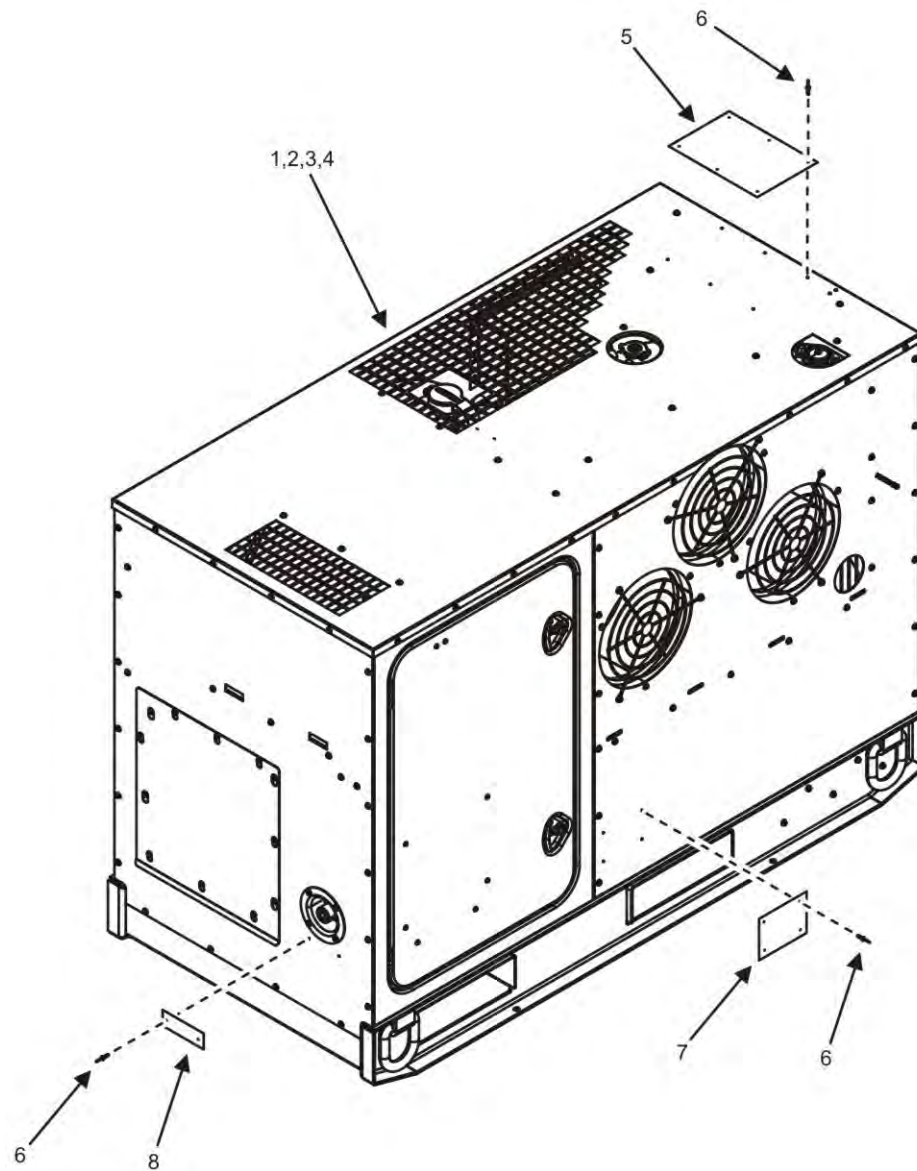


Figure 1. Generator Set (Sheet 1 of 7).

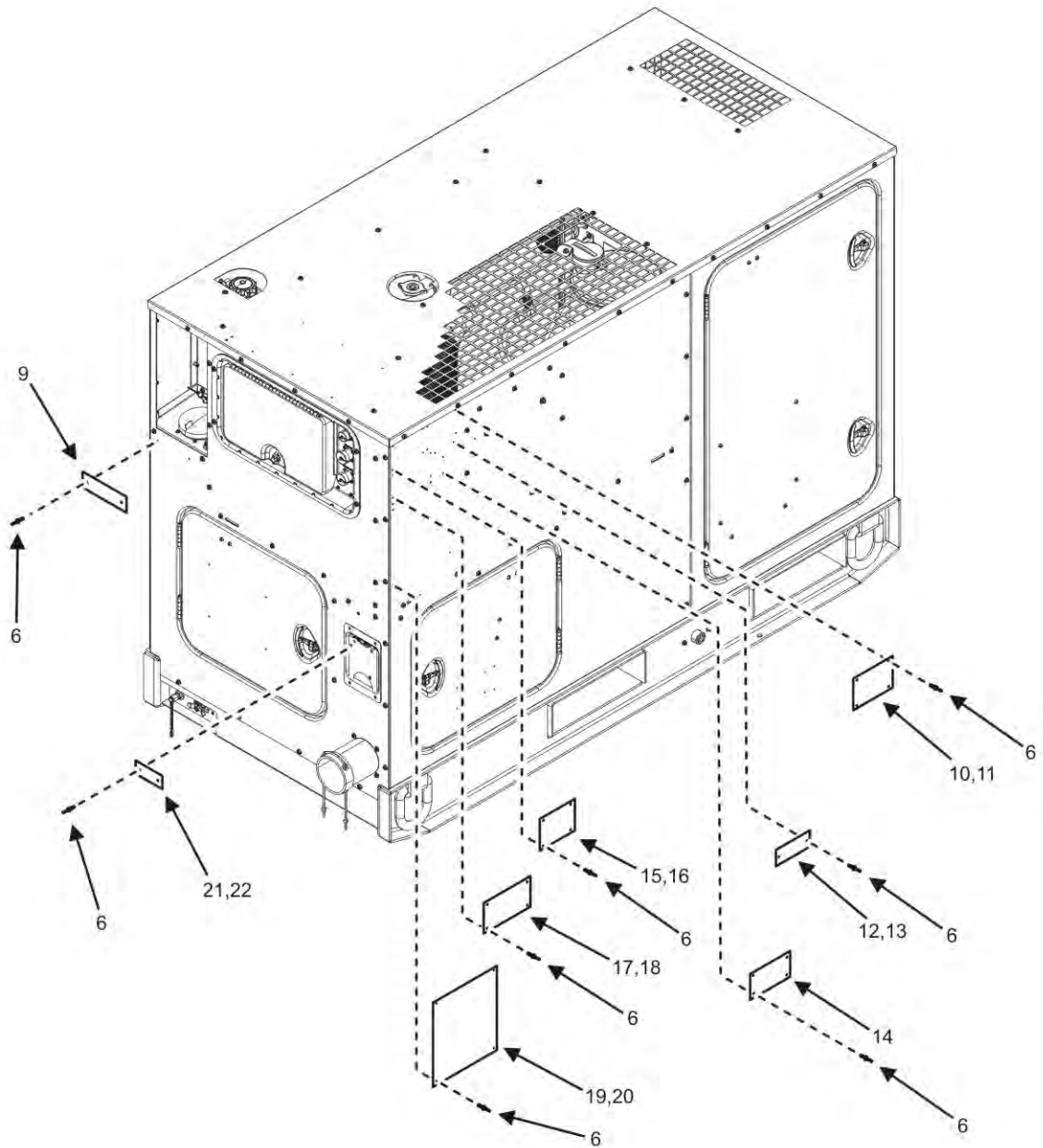


Figure 1. Generator Set (Sheet 2 of 7).



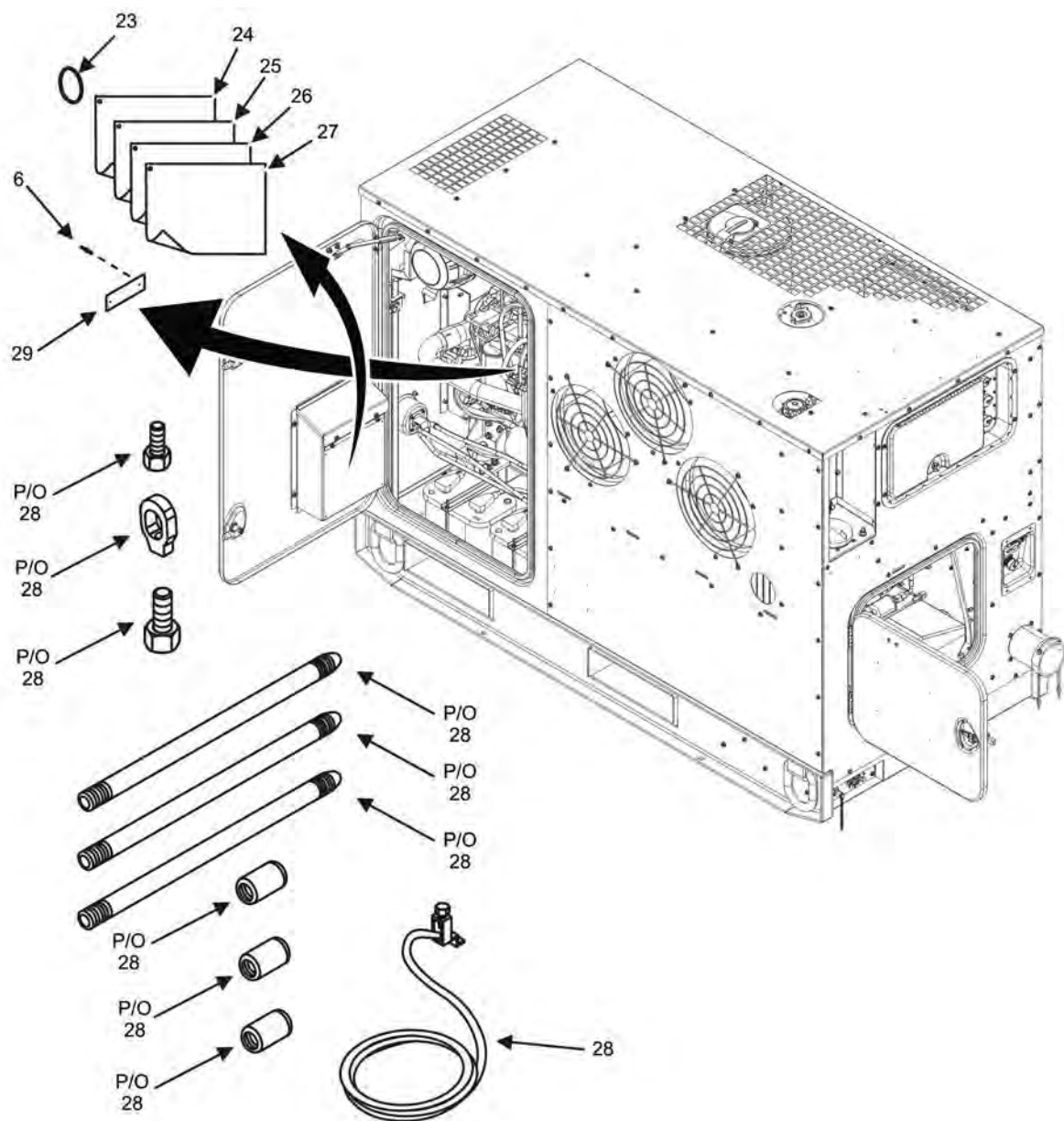


Figure 1. Generator Set (Sheet 3 of 7).

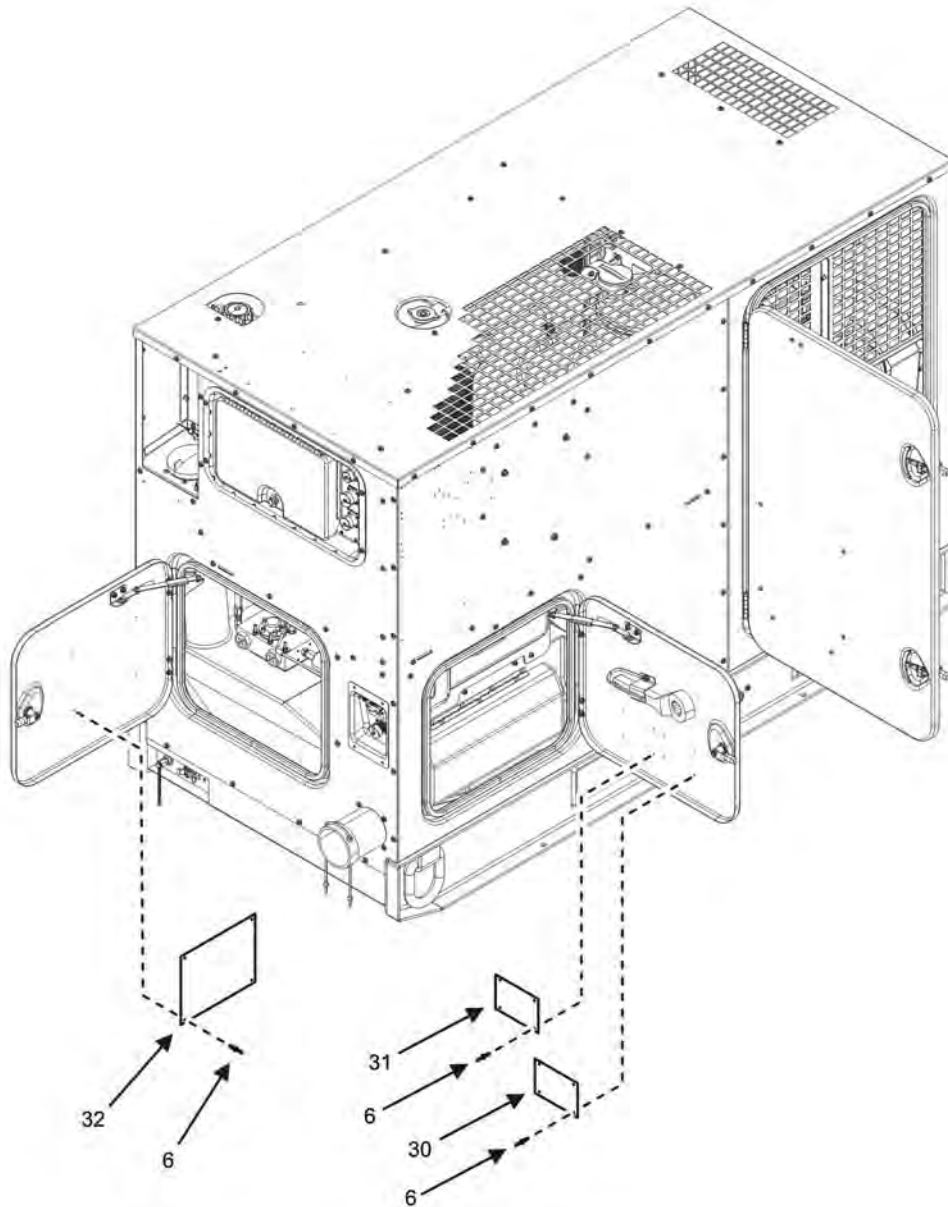


Figure 1. Generator Set (Sheet 4 of 7).

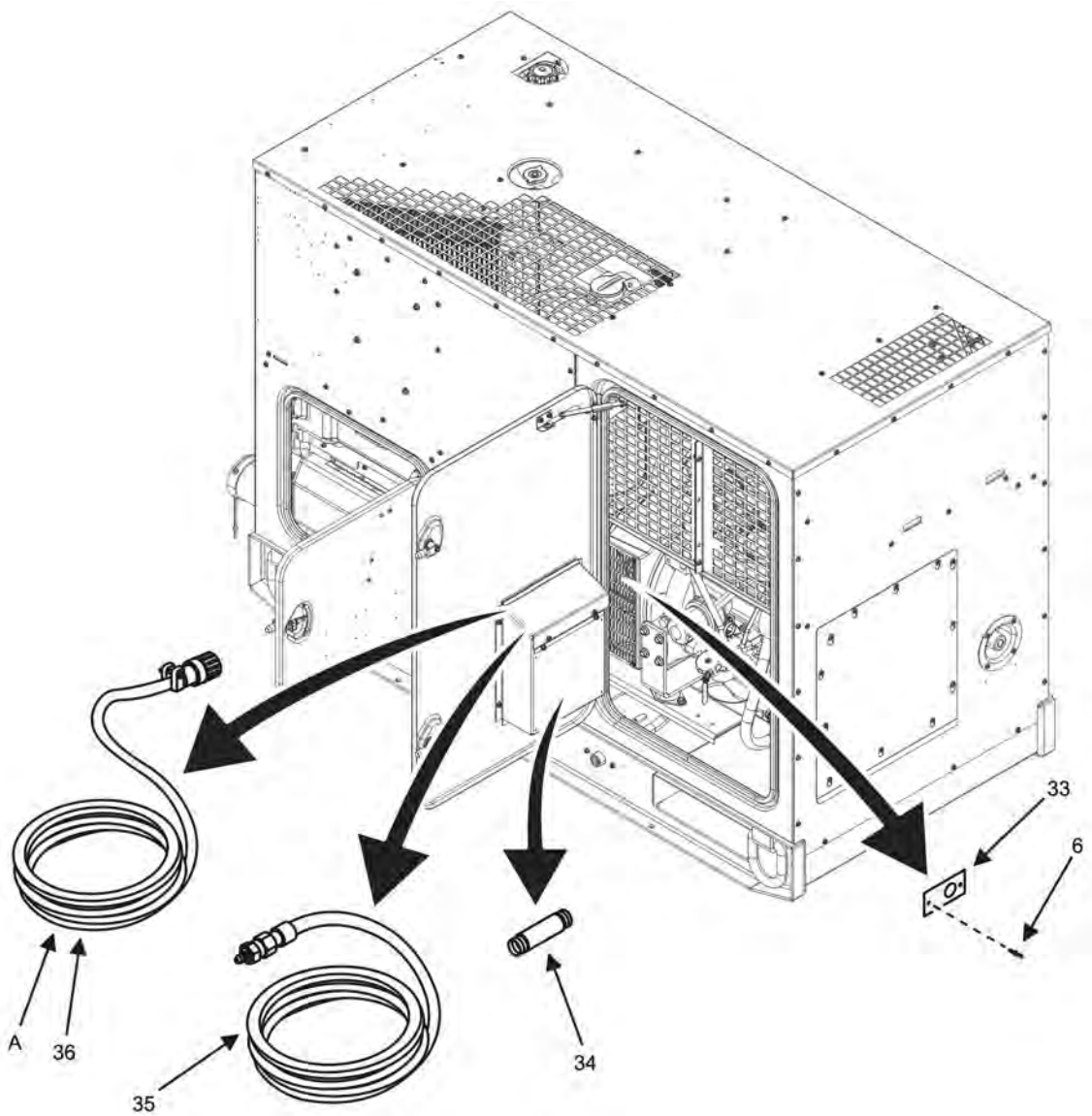


Figure 1. Generator Set (Sheet 5 of 7).

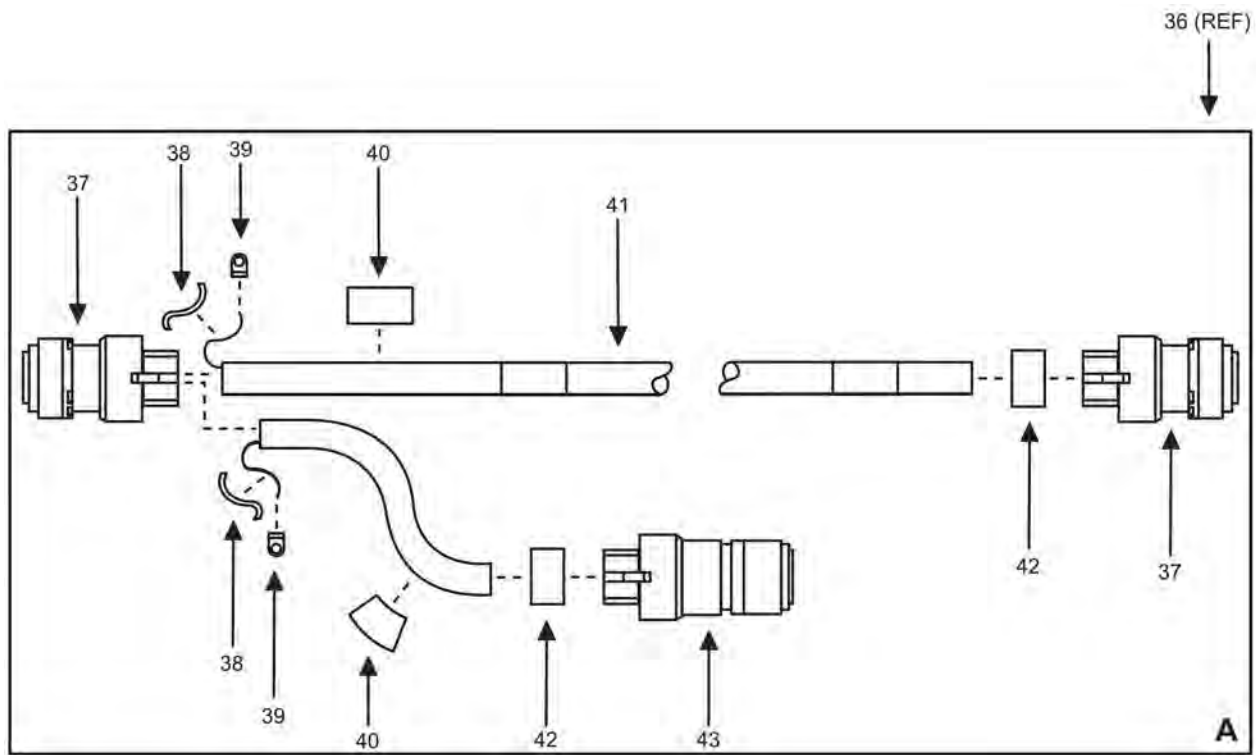


Figure 1. Generator Set (Sheet 6 of 7).

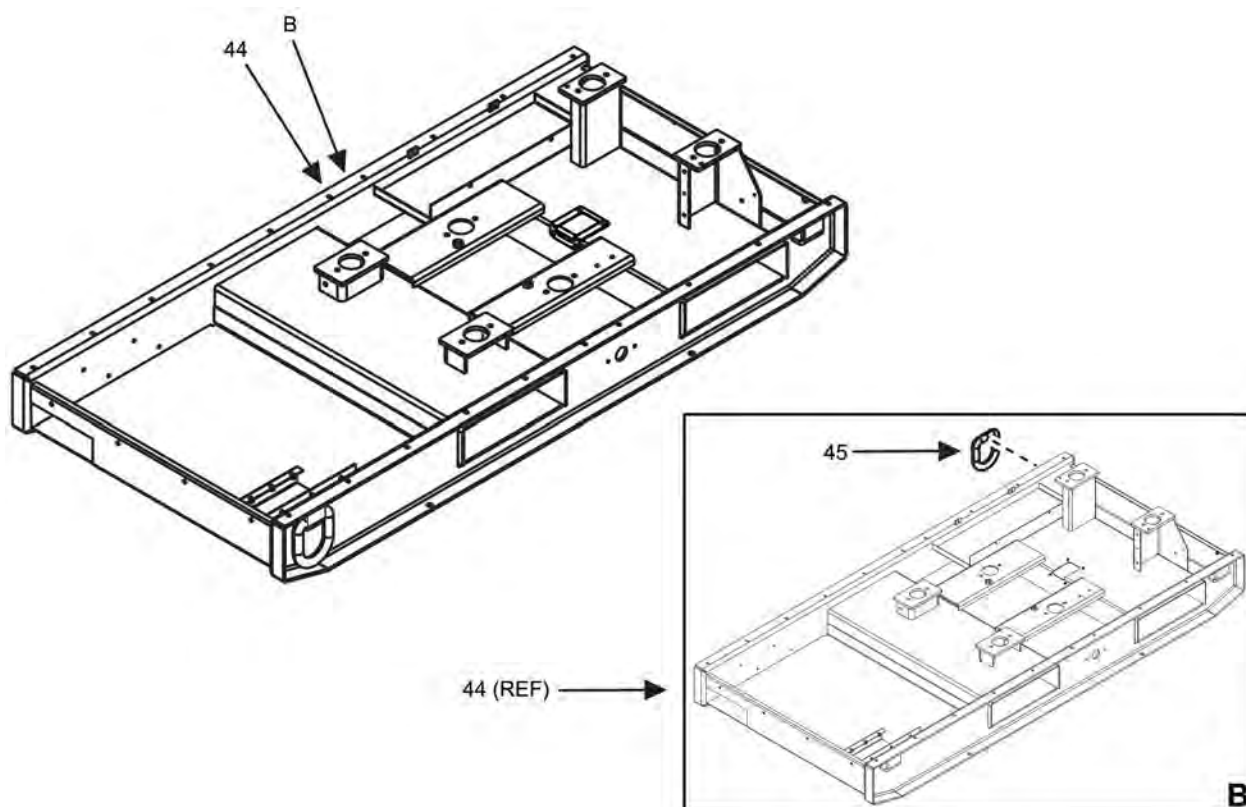


Figure 1. Generator Set (Sheet 7 of 7).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
GROUP 00									
FIG. 1 GENERATOR SET									
1	PAFHH	PAFHH	PAFHH	PAFHH	6115015617718	30554	MEP-1060	GENERATOR SET, DIESEL UOC: 98L	1
2	PAFHH	PAFHH	PAFHH	PAFHH	6115015617738	30554	MEP-1061	GENERATOR SET, DIESEL UOC: 98M	1
3	XAFHH	XAFHH	XAFDD	XAFDD		30554	04-21160	.GENERATOR ASSEMBLY UOC: 98L	1
4	XAFHH	XAFHH	XAFDD	XAFDD		30554	04-21161	.GENERATOR ASSEMBLY UOC: 98M	1
5	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21026	.PLATE, OPERATING INSTRUCTIONS	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5320009321972	81349	M24243/6-A402H	.RIVET, BLIND	54
7	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21025	.PLATE, BATTERY CONNECTION	1
8	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	88-20075	.PLATE, SLAVE, RECEPTACLE	1
9	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21236	.PLATE, FUEL	1

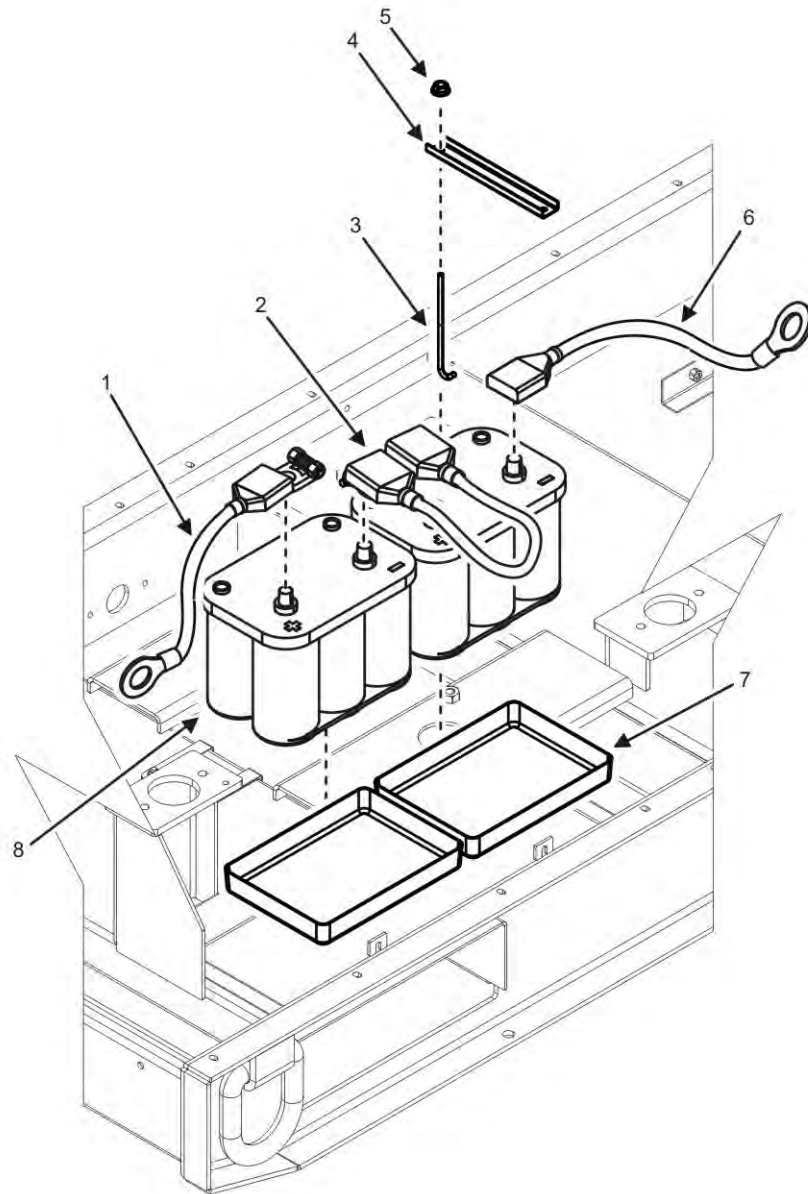
(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
10	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21077-7	.PLATE, IDENTIFICATION, GENERATOR SET UOC: 98L	1
11	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21077-8	.PLATE, IDENTIFICATION, GENERATOR SET UOC: 98M	1
12	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21078-7	.PLATE, UID IDENTIFICATION UOC: 98L	1
13	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21078-8	.PLATE, UID IDENTIFICATION UOC: 98M	1
14	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21011-4	.PLATE, SYSTEM CAPACITY	1
15	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21024-7	.PLATE, IDENTIFICATION, OTAN UOC: 98L	1
16	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21024-8	.PLATE, IDENTIFICATION, OTAN UOC: 98M	1
17	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21022-7	.PLATE, SET RATING UOC: 98L	1
18	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21022-8	.PLATE, SET RATING UOC: 98M	1
19	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21023-7	.PLATE, LIFTING AND TIE DOWN UOC: 98L	1
20	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21023-8	.PLATE, LIFTING AND TIE DOWN UOC: 98M	1
21	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21237	.PLATE, PARALLELING, RECEPTACLE UOC: 98L	1
22	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21240	.PLATE, PARALLELING, RECEPTACLE UOC: 98M	1
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	98-19694	.BOOK RING	1
24	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-20009-1	.LAMINATE, WIRING DIAGRAM 30KW, 50/60/400 HZ	1
25	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-20009-2	.LAMINATE, WIRING DIAGRAM 30KW, 50/60/400 HZ	1
26	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-20009-3	.LAMINATE, WIRING DIAGRAM 30KW, 50/60/400 HZ	1
27	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21382	.LAMINATE, SCHEMATIC DIAGRAM 30KW, 50/60/400 HZ	1
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5975008783791	58536	AA55804-3B 9FT	.ROD, GROUND	1
29	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21016	.PLATE, FIRST FUEL FILTER	1
30	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	88-20110	.PLATE, CAUTION, VOLTAGE	1
31	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21475-2	.PLATE, GROUNDING STUD	1

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
32	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21017-2	.PLATE, INFORMATION, FUEL	1
33	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	88-21776	.PLATE, DEAD CRANK	1
34	PAFZZ	PAFZZ	PAFZZ	PAFZZ		39428	9176K155	.NIPPLE, PIPE	1
35	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4720000213320	01276	FA1493FFF3000	.HOSE ASSEMBLY, FUEL	1
36	PAFFF	PAFFF	PAFFF	PAFFF	6150015860026	44940	04-21228	.HARNES, CONTROL	1
37	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0PCR1	CD3106E18-19P	.CONNECTOR, PLUG, ELECTRICAL	2
38	XBFZZ	XBFZZ	XBFZZ	XBFZZ		85901	ATUM 24/6-0	..SLEEVE, HEAT SHRINK (MAKE FROM ATUM 24/6-0 ON BULK ITEMS LIST CUT TO LENGTH AS NEEDED)	2
39	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940004640117	00779	36152	..TERMINAL, LUG	2
40	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG3T3-100B	..LAMINATE, LABEL	4
41	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0PCR1	CD042256C	..CABLE, SHEILDED (MAKE FROM 090130SWC8 ON BULK ITEMS LIST CUT TO LENGTH AS NEEDED)	1
42	MFFZZ	MFFZZ	MFFZZ	MFFZZ		30554	88-20541-1	..INSULATION SLEEVING (MAKE FROM 88-20541-1 ON BULK ITEMS LIST CUT TO LENGTH AS NEEDED)	2
43	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0PCR1	CD3101E18-195	..CONNECTOR, PLUG, ELECTRICAL	1
44	XAFFF	XAFFF	XAFFF	XAFFF		44940	04-20606	...SKID ASSEMBLY	1
45	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20587	....EYE, LIFTING	4
END OF FIGURE									





**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**DC ELECTRIC INSTALLATION REPAIR PARTS LIST**



**Figure 2. DC Electric Installation (Sheet 1 of 4).**

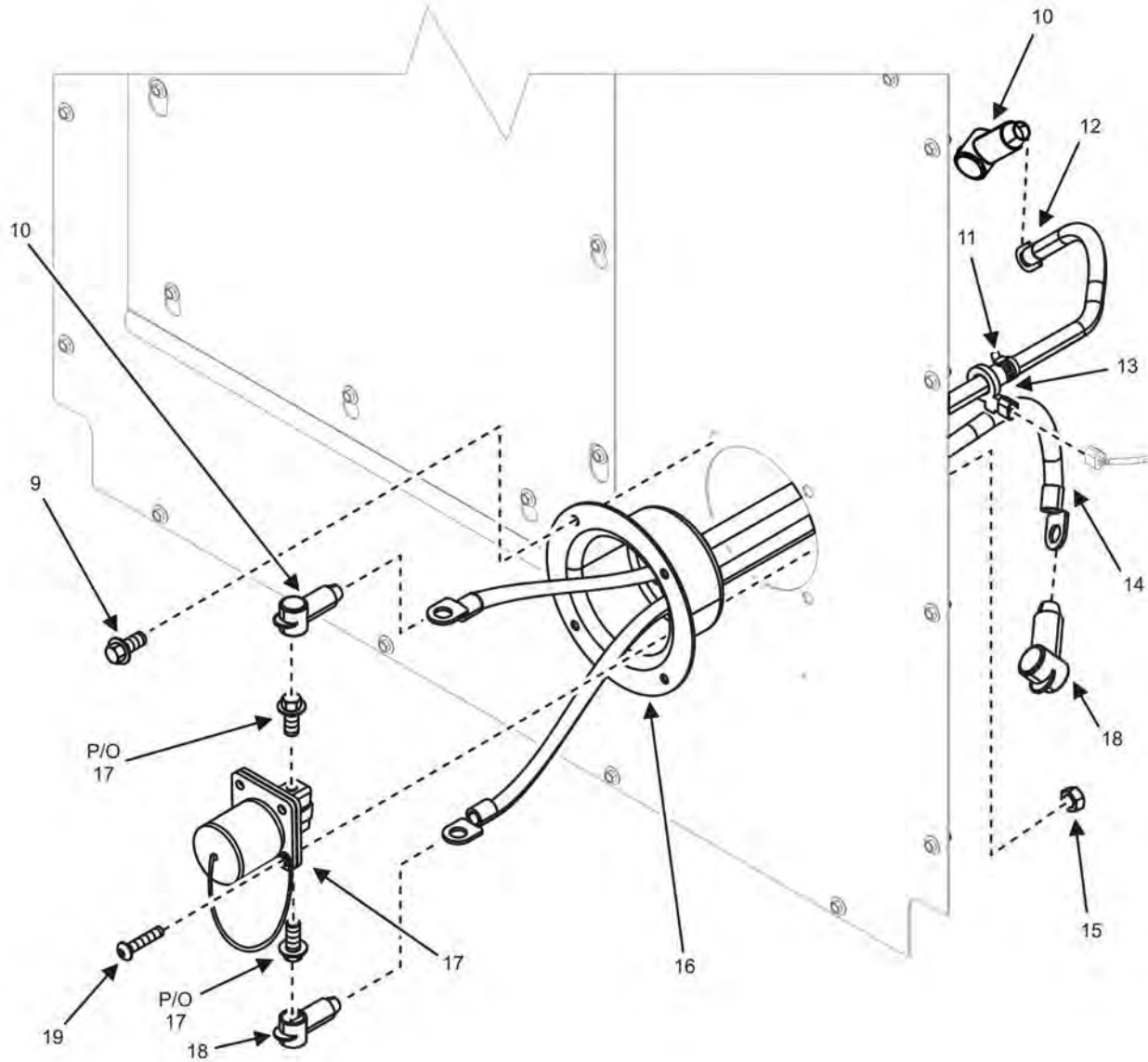


Figure 2. DC Electric Installation (Sheet 2 of 4).

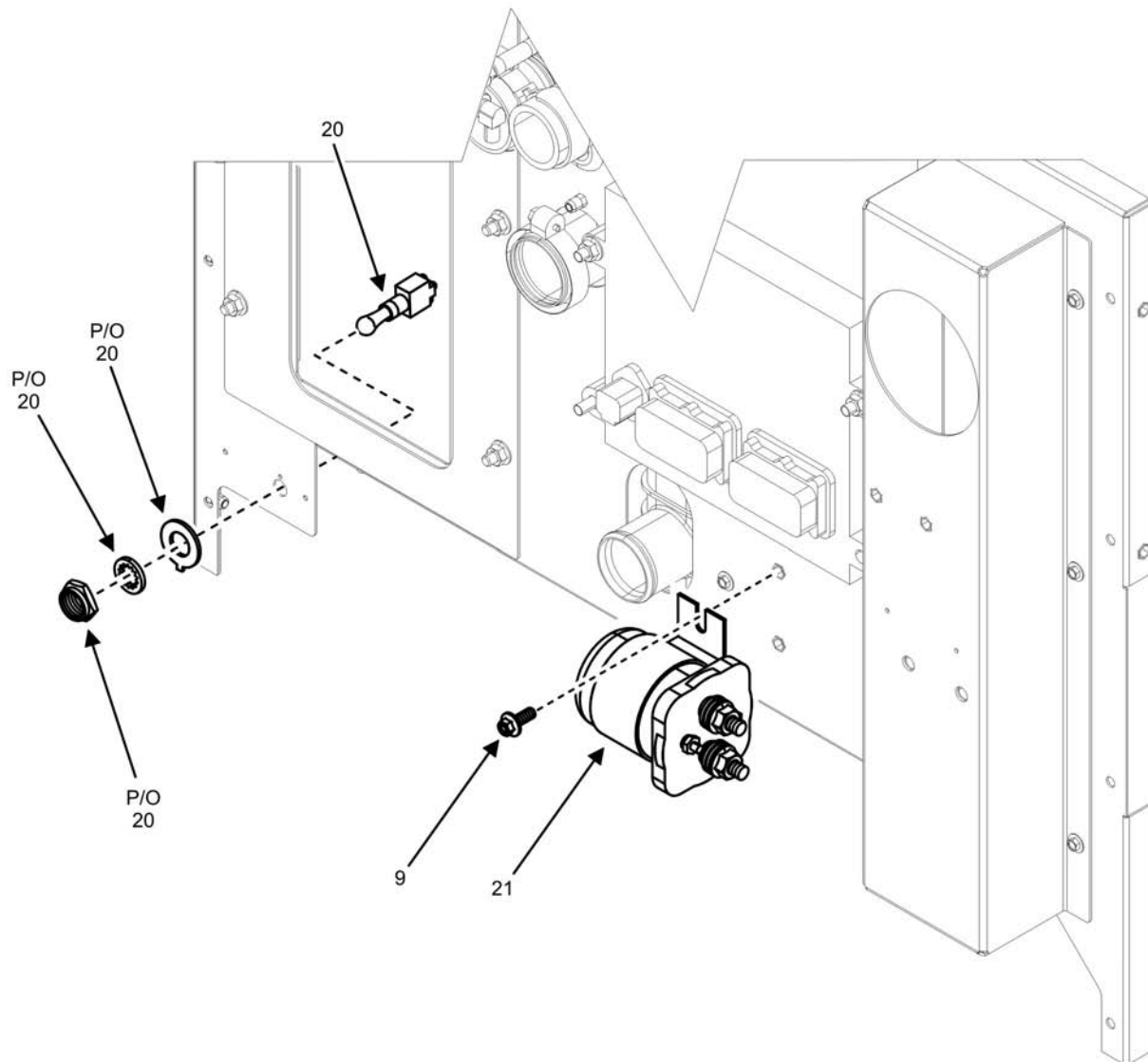


Figure 2. DC Electric Installation (Sheet 3 of 4).

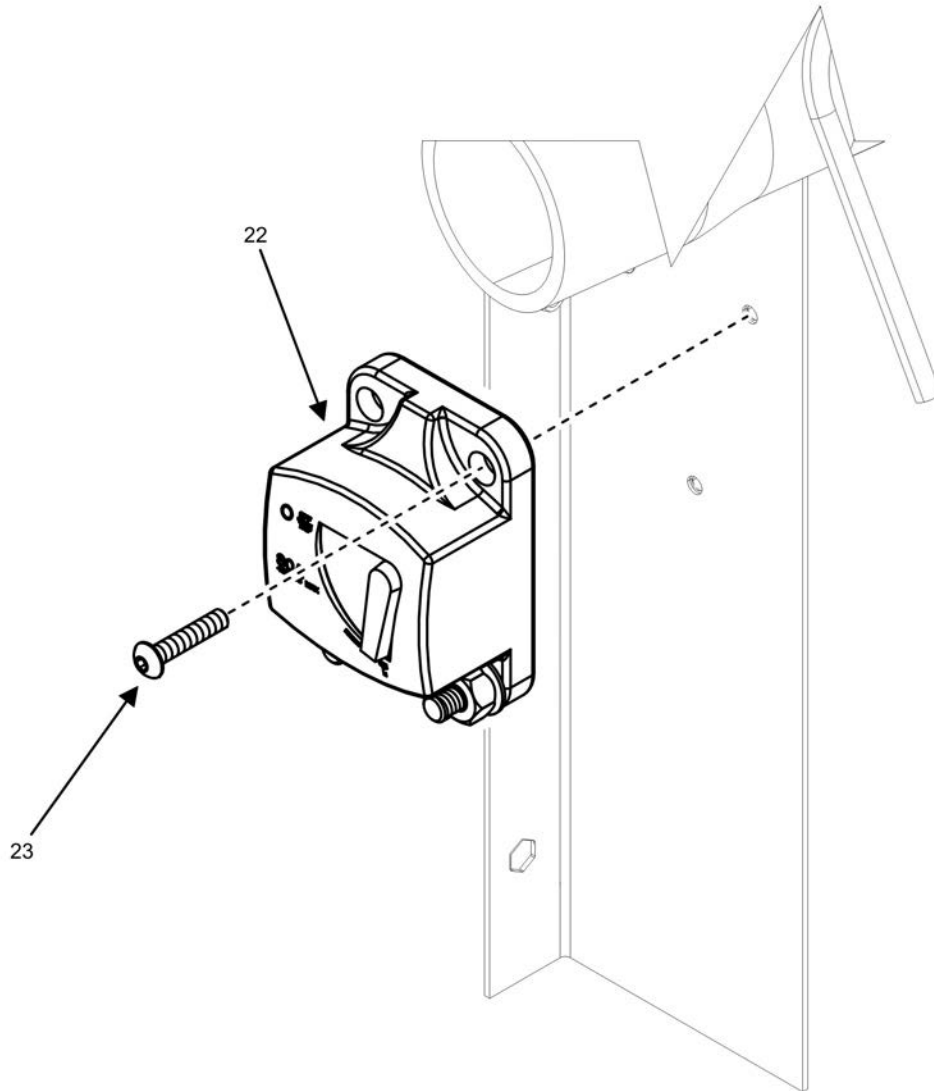
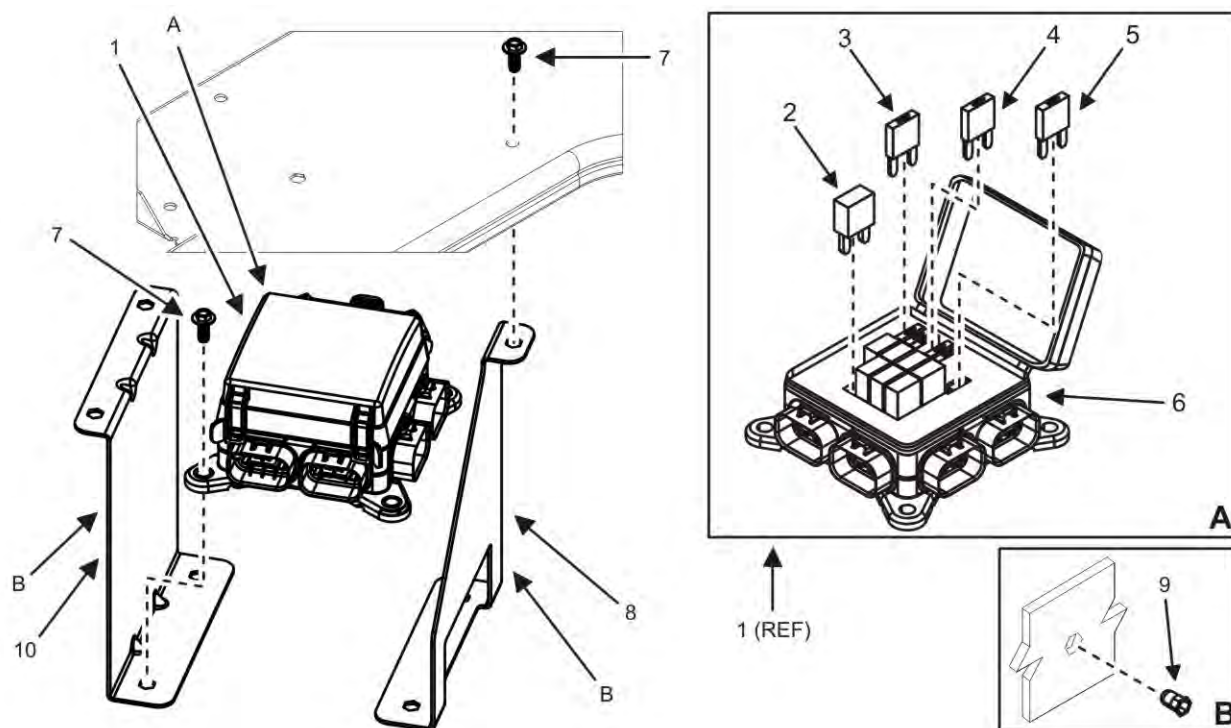


Figure 2. DC Electric Installation (Sheet 4 of 4).

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 01									
FIG. 2 DC ELECTRIC INSTALLATION									
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6150015956739	44940	04-20674-7	.LEAD, BATTERY, POSITIVE	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20673-3	.LEAD, ELECTRICAL, JUMPER	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6160015971208	44940	04-21470	.ROD, BATTERY RETAINER	4
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6160015973421	44940	04-21469	.HOLDER, BATTERY, PLATE	2
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	.NUT, PLAIN, EXTENDED	4
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6150015959390	44940	04-20674-8	.LEAD, BATTERY, NEGATIVE	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6160015970887	44940	04-20586	.TRAY, BATTERY	2
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6140013788232	0UJ55	8002-002/MDL. NO. 34	.BATTERY, STORAGE	2
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		4M343	44832	.SCREW, FLANGE HEAD, M6	6
10	PCFZZ	PCFZZ	PCFZZ	PCFZZ		7Z043	228N3T02	.BOOT, DUST AND MOISTURE	2
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		06383	PLT4S-M30	.STRAP, TIEDOWN, ELECTRICAL	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6150015959484	44940	04-20675-7	.LEAD, ELECTRICAL, NATO SLAVE, POSITIVE	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0S2B6	HAB-80-S	.SENSOR, CURRENT	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6150015959236	44940	04-20675-8	.LEAD, ELECTRICAL, NATO SLAVE, NEGATIVE	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310011688140	1FH08	DIN934M5	.NUT, HEX, M5	4
16	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20645	.TERMINAL BOX	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935010979974	19207	11674728	.CONNECTER, RECEPTACLE	1
18	PCFZZ	PCFZZ	PCFZZ	PCFZZ		7Z043	228N3T14	.BOOT, DUST AND MOISTURE	2
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN7380A2-M5X25	.SCREW, CAP, SOCKET HEAD	4
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5930006831625	96906	MS24523-31	..SWITCH, TOGGLE, DEAD CRANK	1
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ		62274	586-114112	.SWITCH, RELAY, ELECTROMAGNETIC	1
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5925015894819	1UW16	187080F-03-1	.CIRCUIT BREAKER	1
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES46M407010WA3A 41	.SCREW, BUTTON HEAD, M4	3
END OF FIGURE									



**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**RELAY PANEL ASSEMBLY REPAIR PARTS LIST**



**Figure 3. Relay Panel Assembly**

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 0101	
								FIG. 3 RELAY PANEL ASSEMBLY	
1	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20209	.PANEL, RELAY	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		1UW16	301-1C-S-D2-B120-7031	..RELAY	
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5925015694427	1UW16	22320-200	..CIRCUIT BREAKER	8
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5925015715799	1UW16	22330-200	..CIRCUIT BREAKER	5
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5925015696394	1UW16	22310-200	..CIRCUIT BREAKER	1
6	XBFZZ	XBFZZ	XBFZZ	XBFZZ		1UW16	31S-276-0U	..HOUSING, PANEL, RELAY	2
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015967033	0KMA3	A026G000	..SCREW, CAP, HEXAGON HEAD	1
8	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21442	..BRACKET, MOUNTING	7
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893727	3A2G6	39101-76030	..NUT, PLAIN, CLINCH	1
10	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21441	..BRACKET, MOUNTING	7
								END OF FIGURE	1

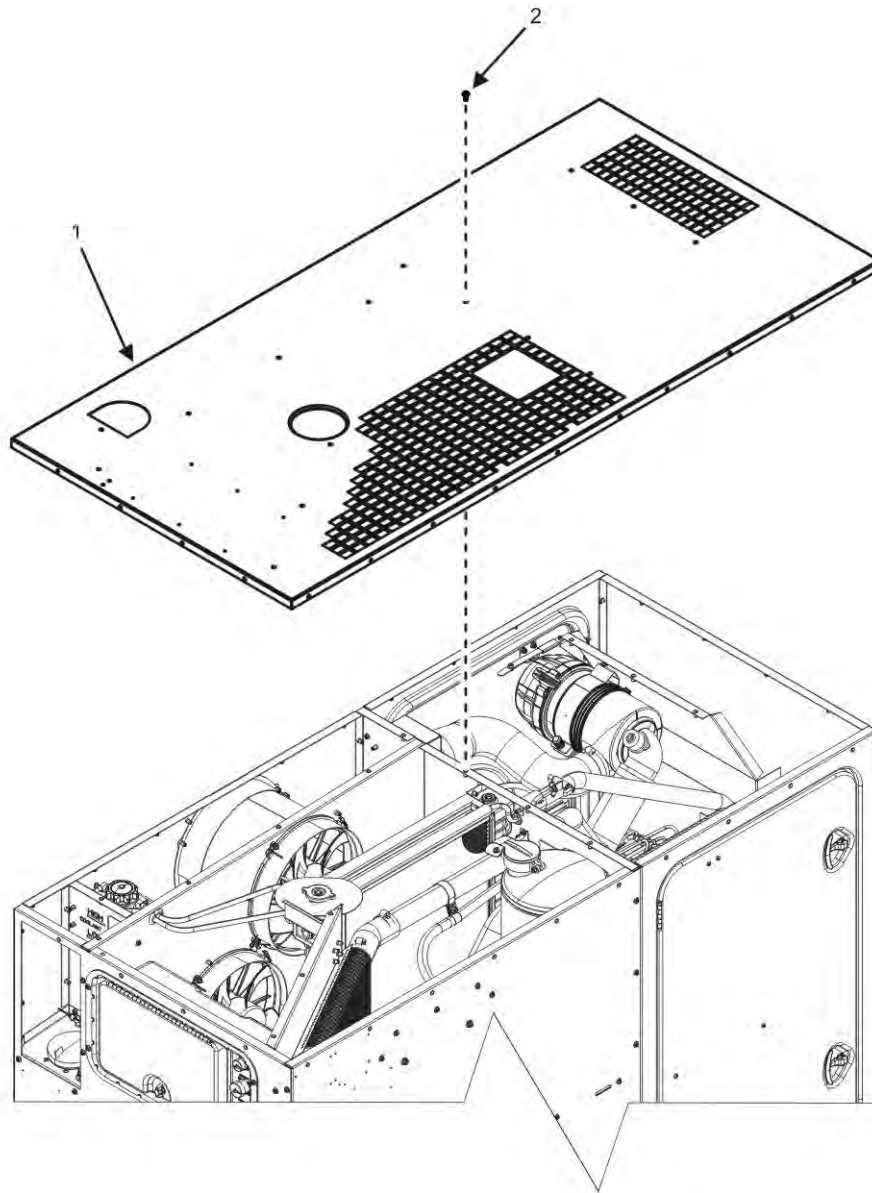




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**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
HOUSING INSTALLATION REPAIR PARTS LIST**

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**Figure 4. Housing Installation (Sheet 1 of 16).**

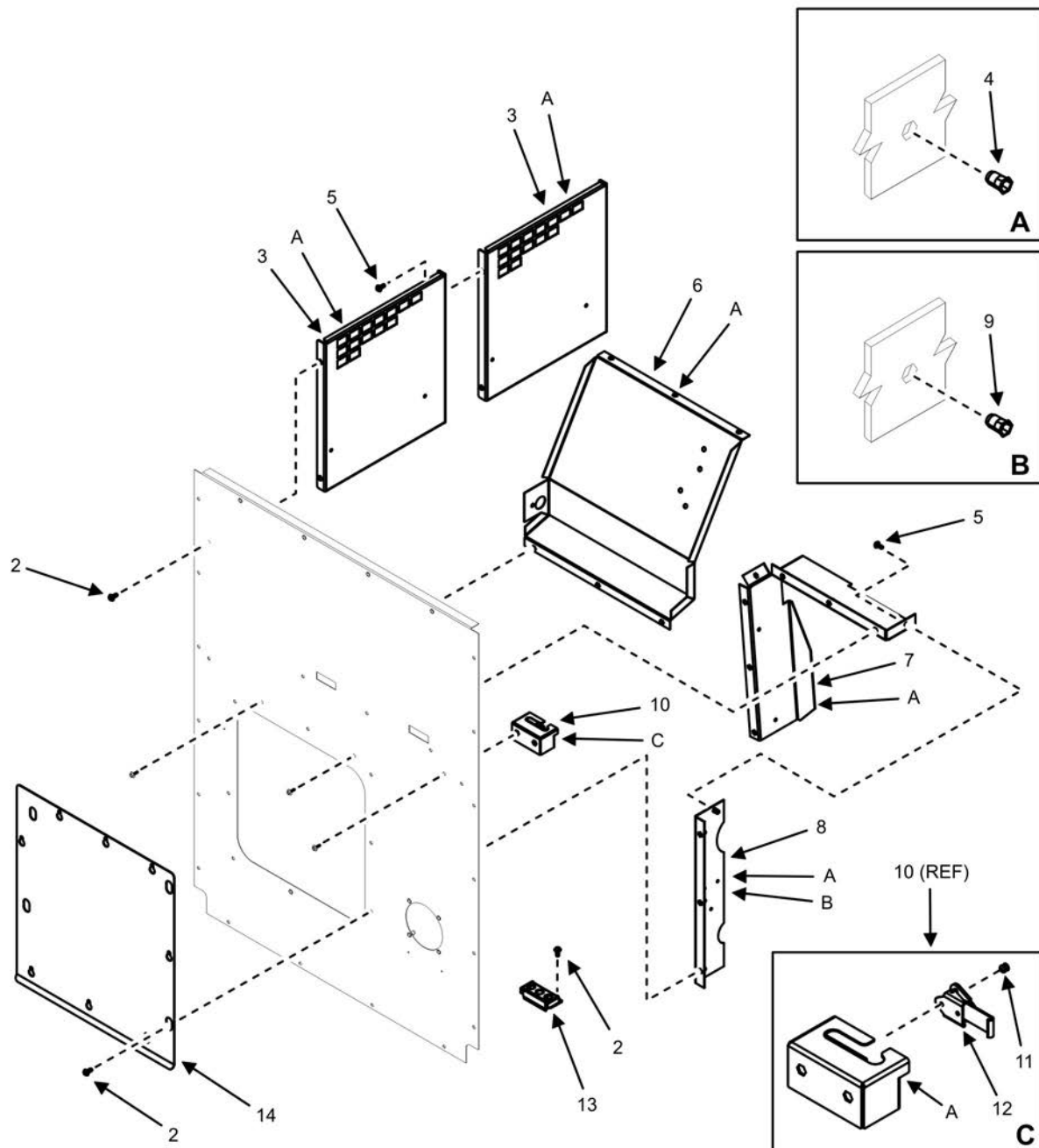


Figure 4. Housing Installation (Sheet 2 of 16).

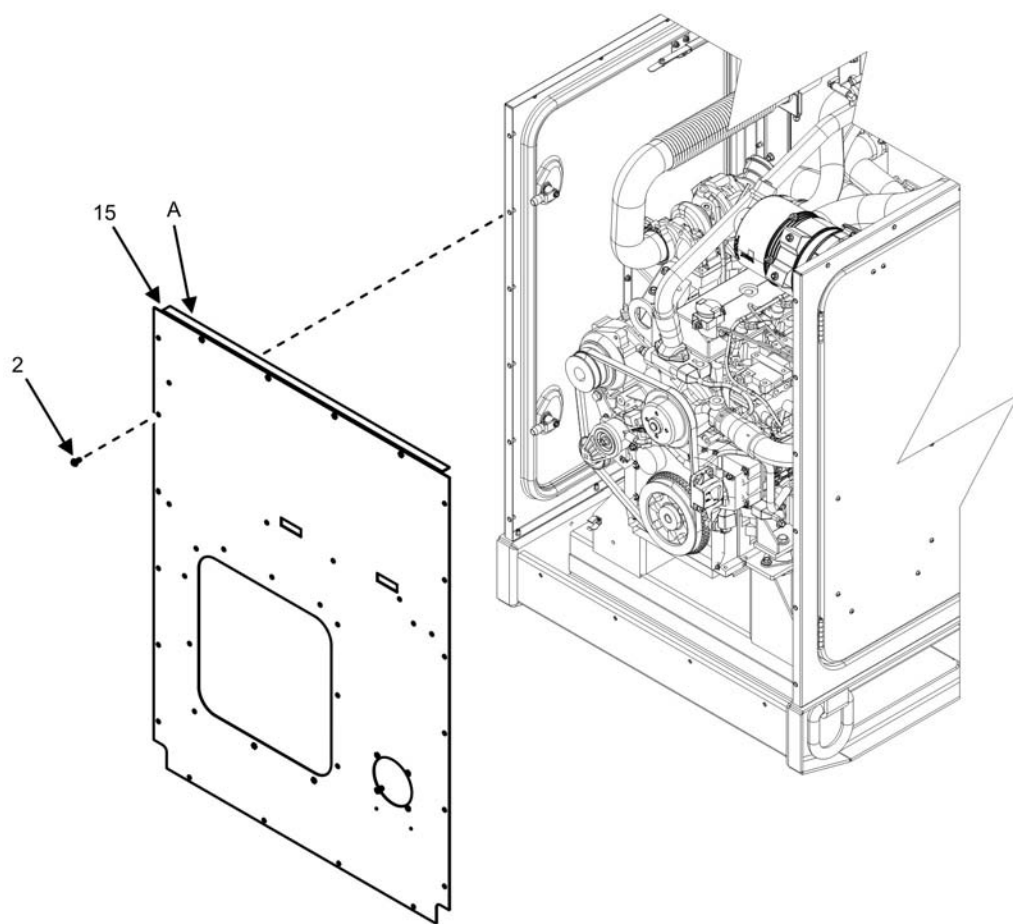


Figure 4. Housing Installation (Sheet 3 of 16).

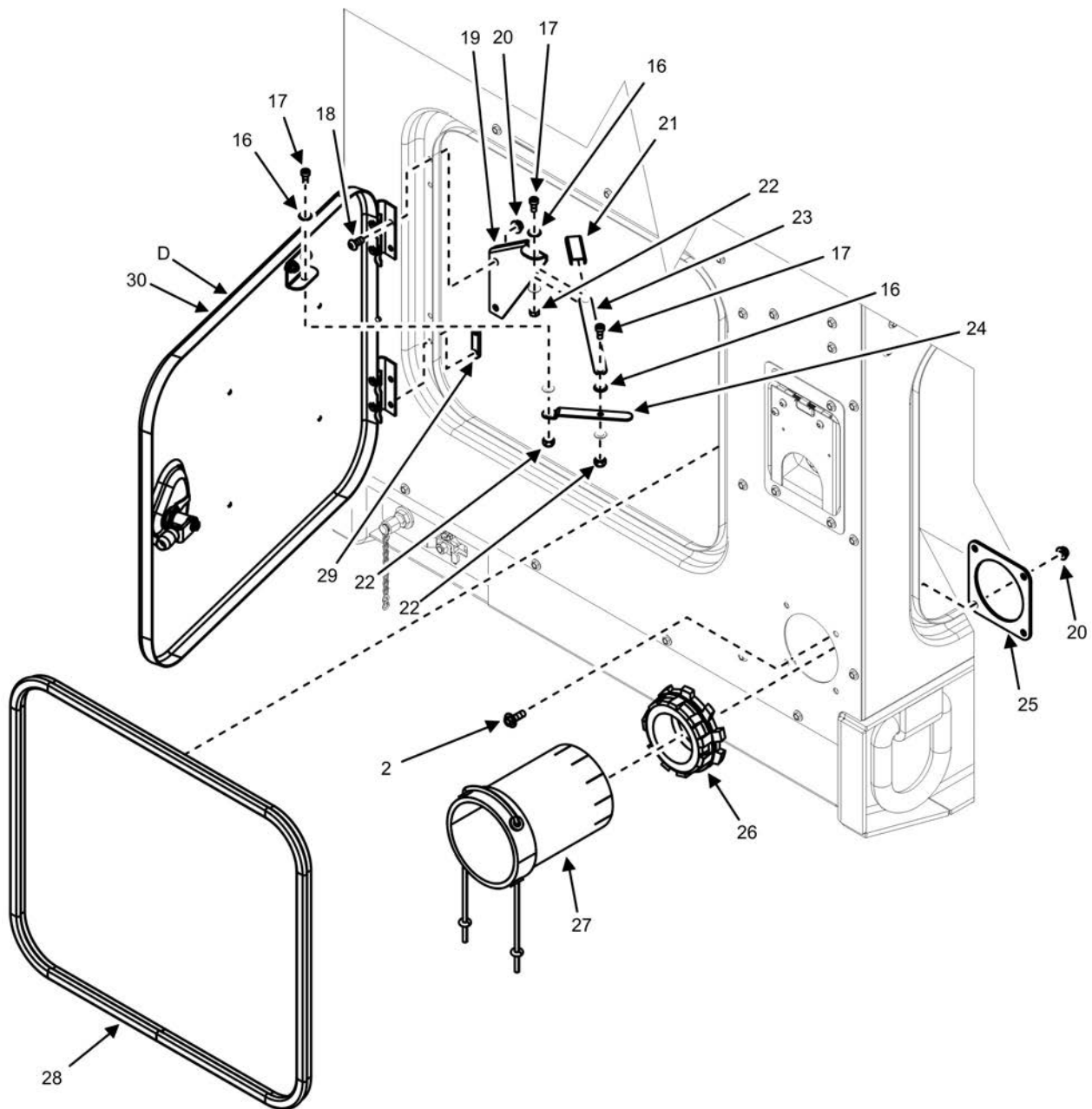


Figure 4. Housing Installation (Sheet 4 of 16).

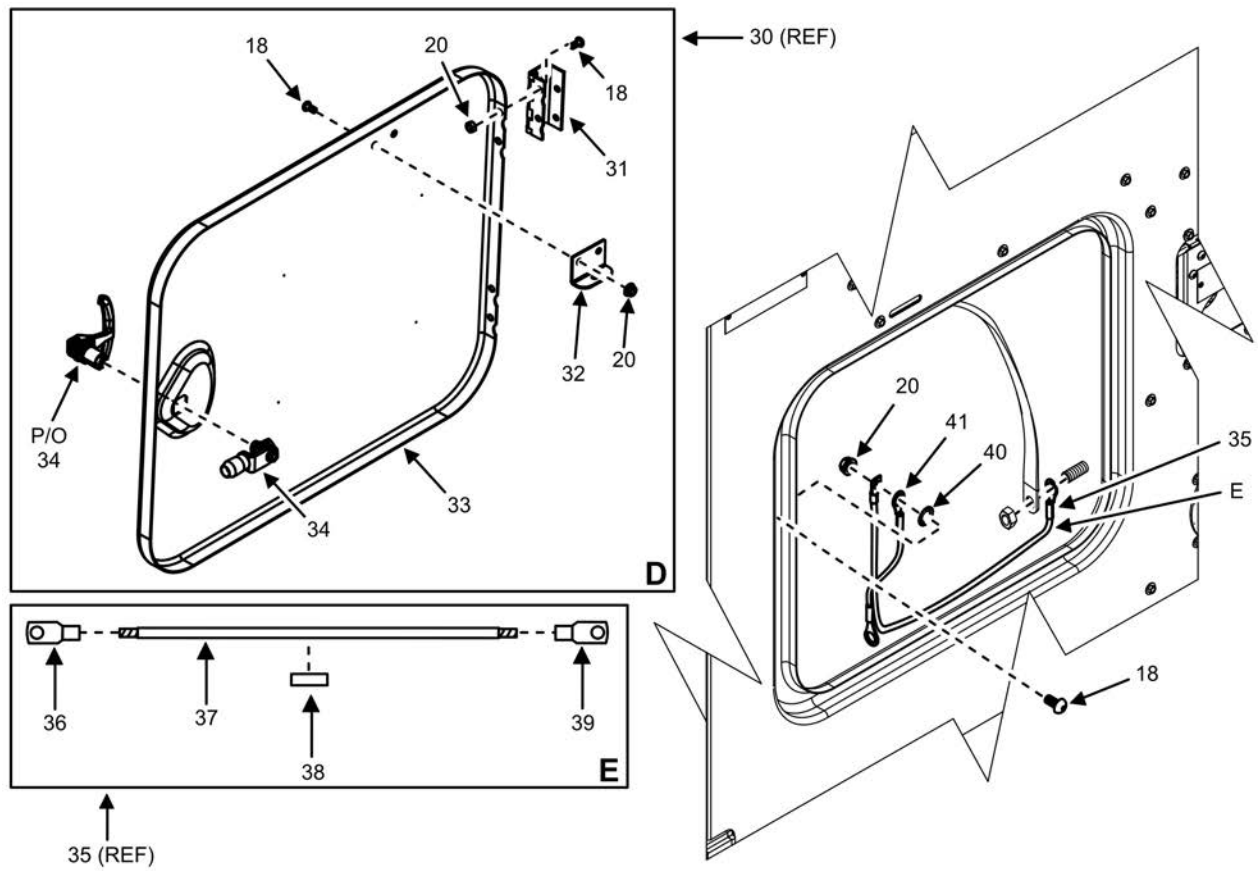


Figure 4. Housing Installation (Sheet 5 of 16).

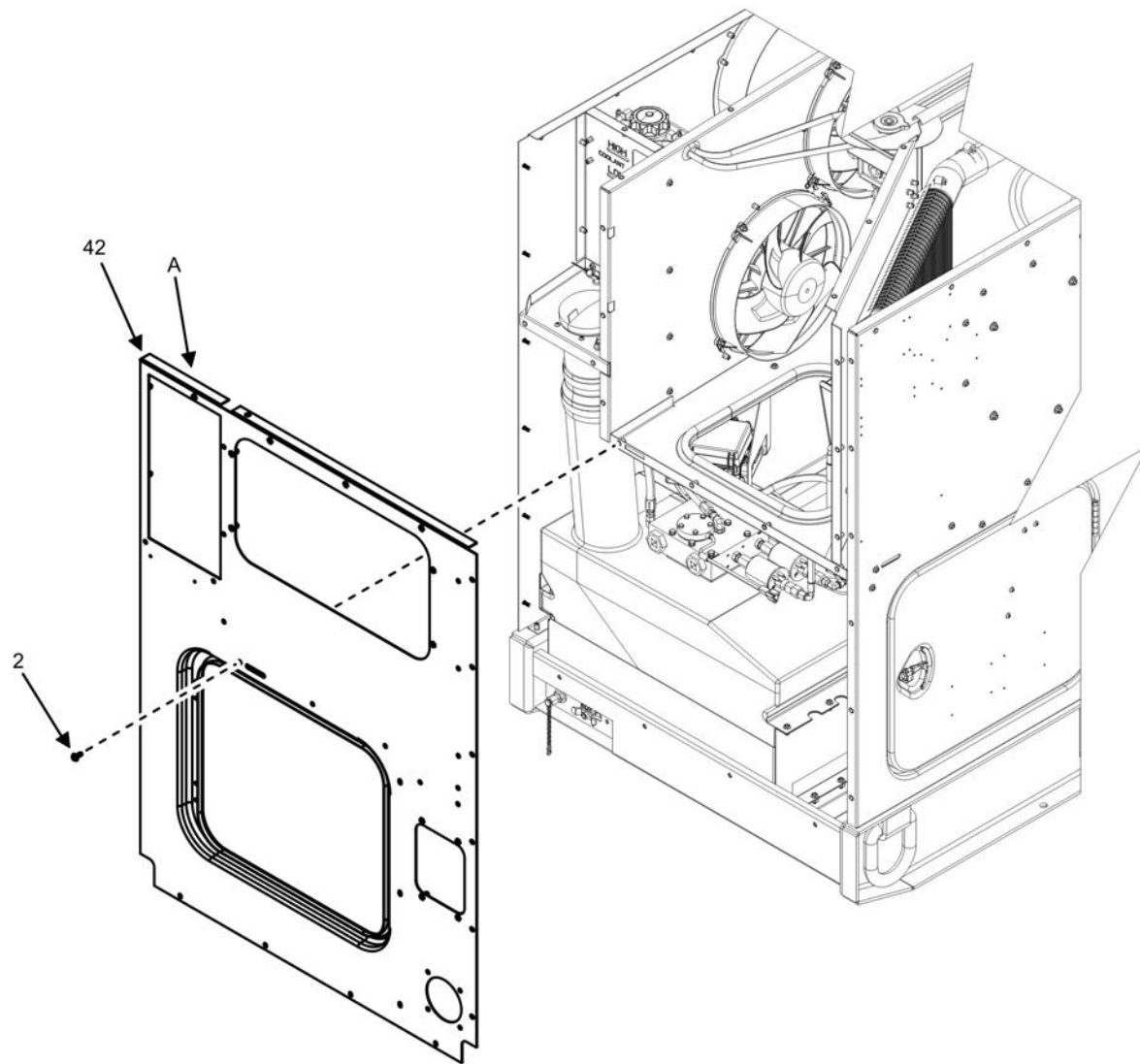


Figure 4. Housing Installation (Sheet 6 of 16).

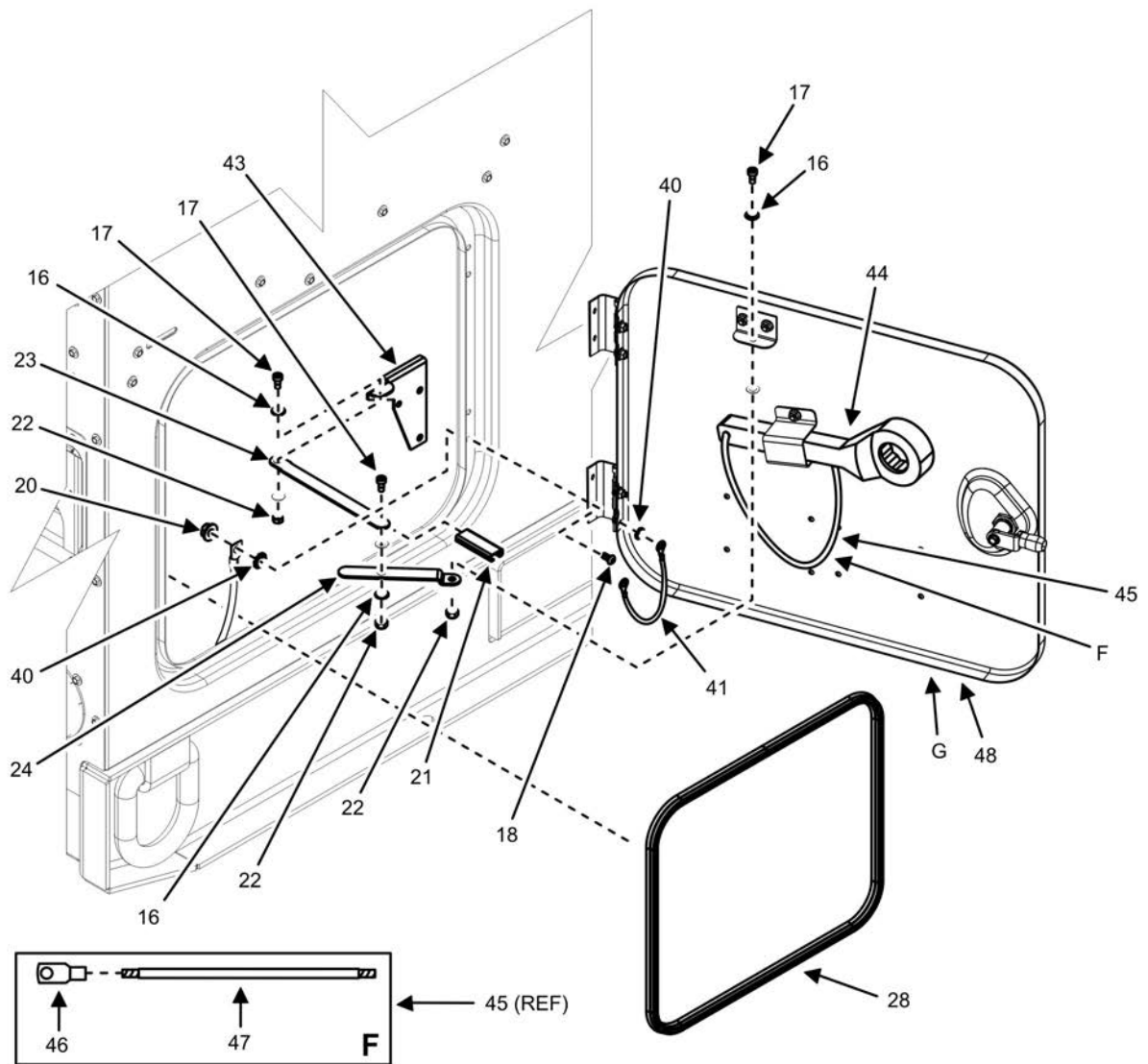


Figure 4. Housing Installation (Sheet 7 of 16).

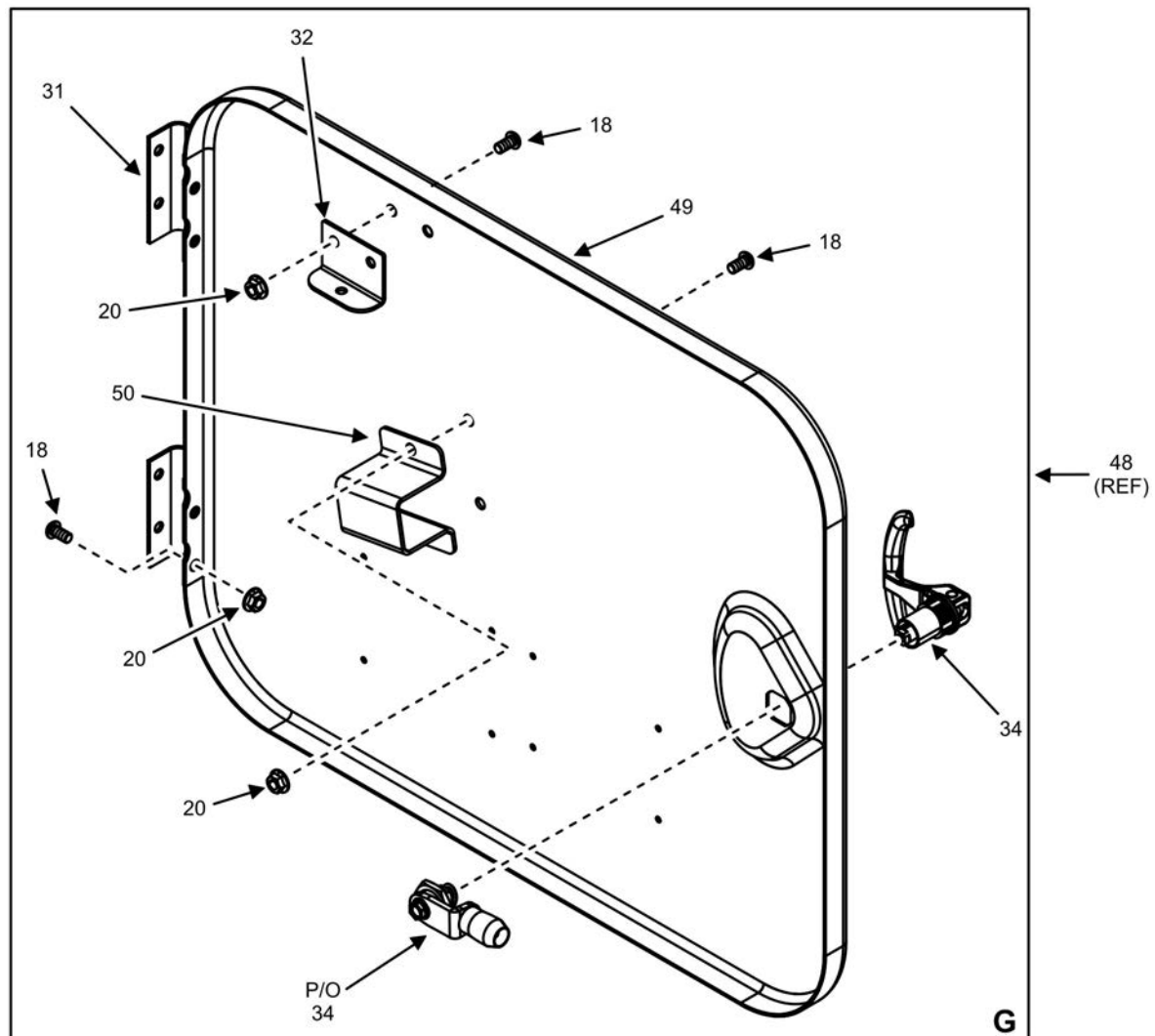


Figure 4. Housing Installation (Sheet 8 of 16).



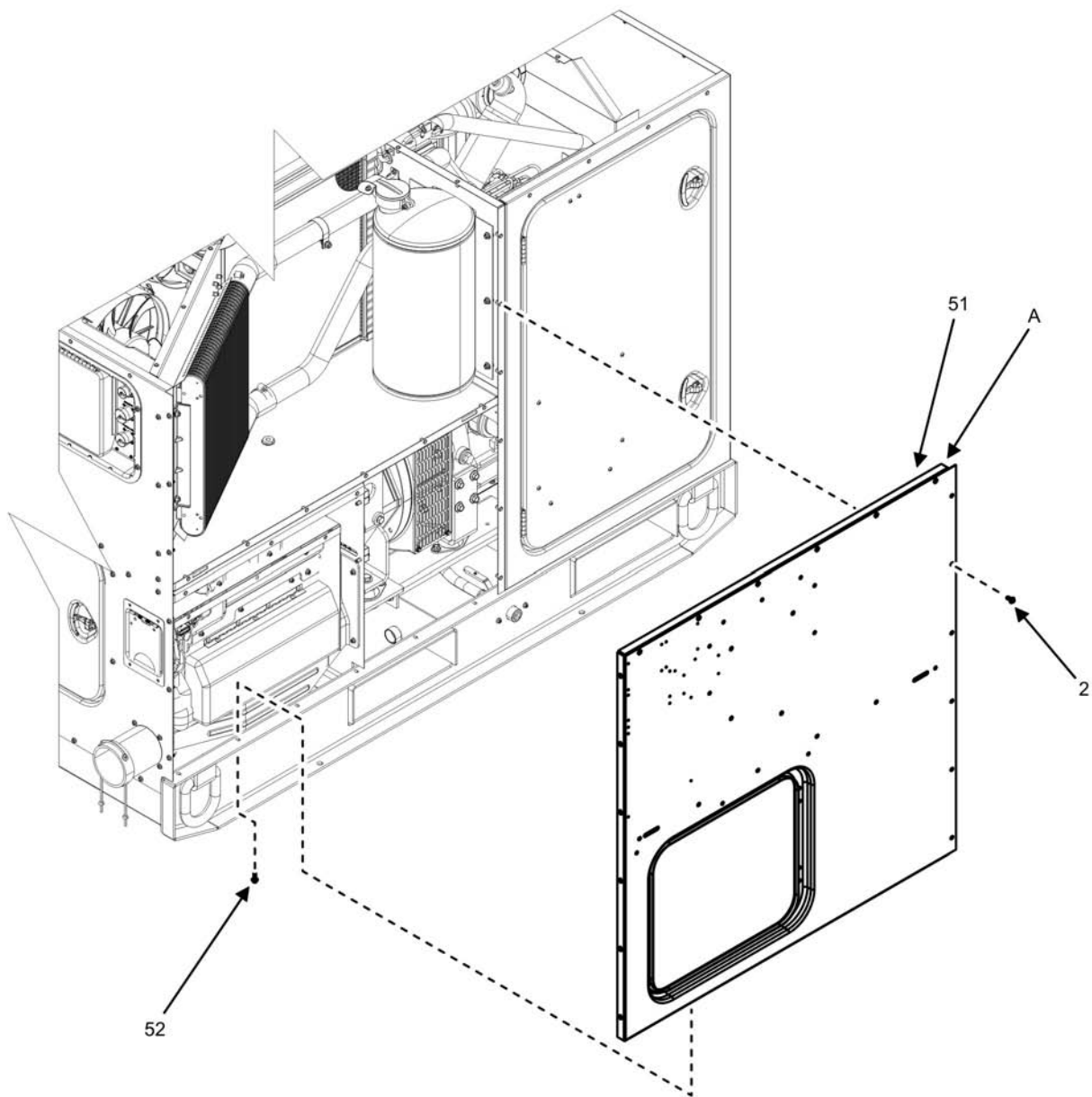


Figure 4. Housing Installation (Sheet 9 of 16).

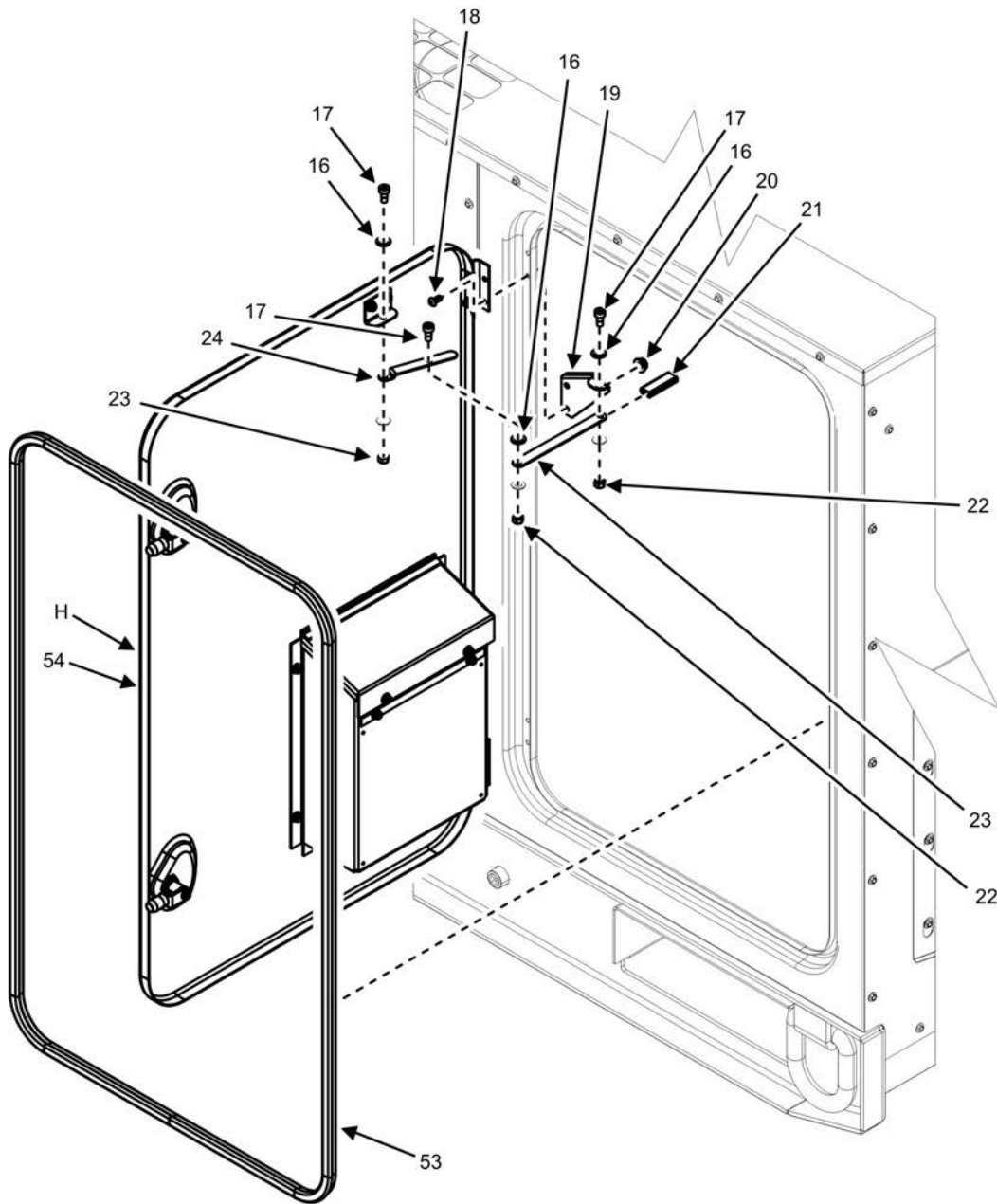


Figure 4. Housing Installation (Sheet 10 of 16).

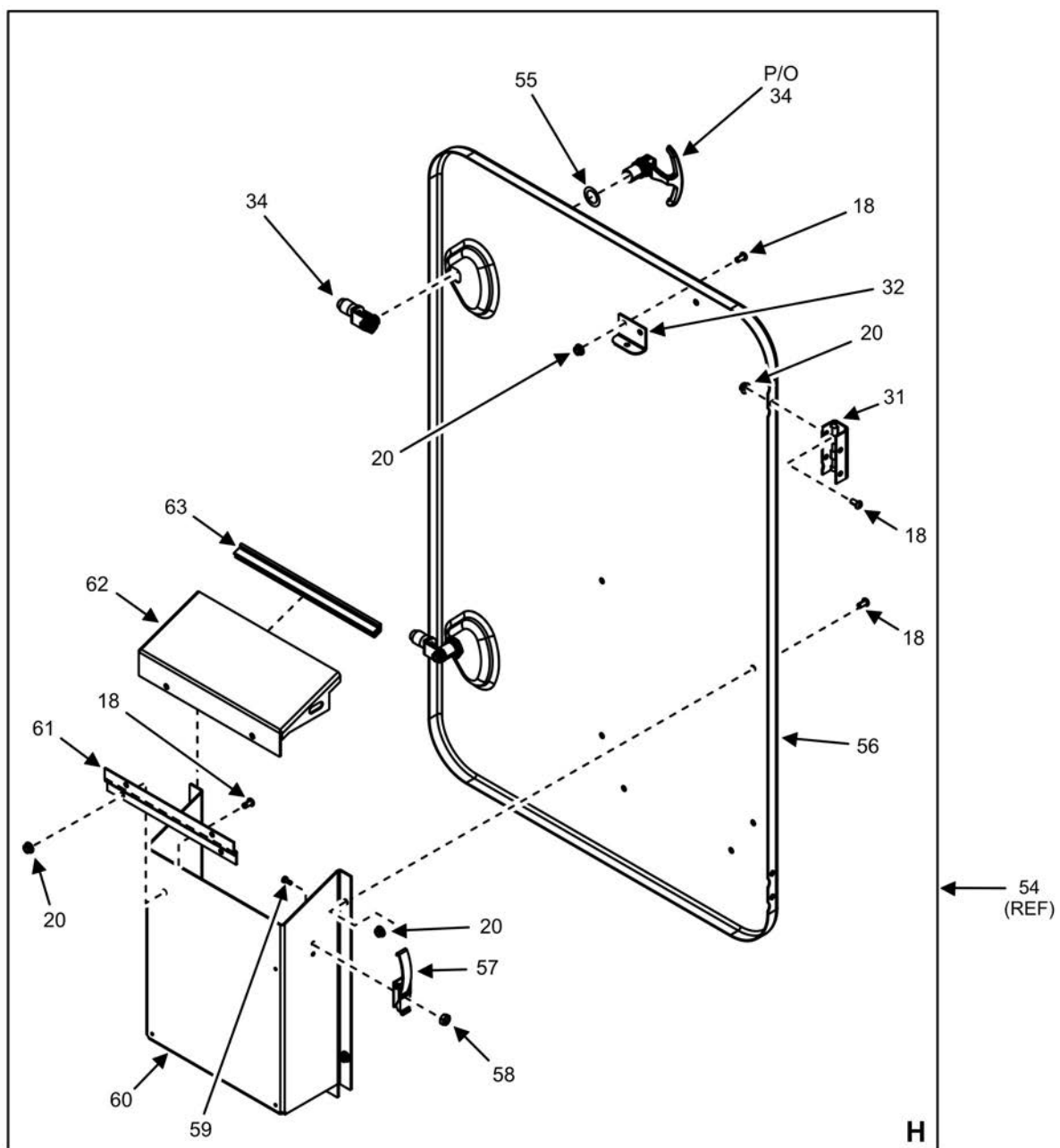


Figure 4. Housing Installation (Sheet 11 of 16).

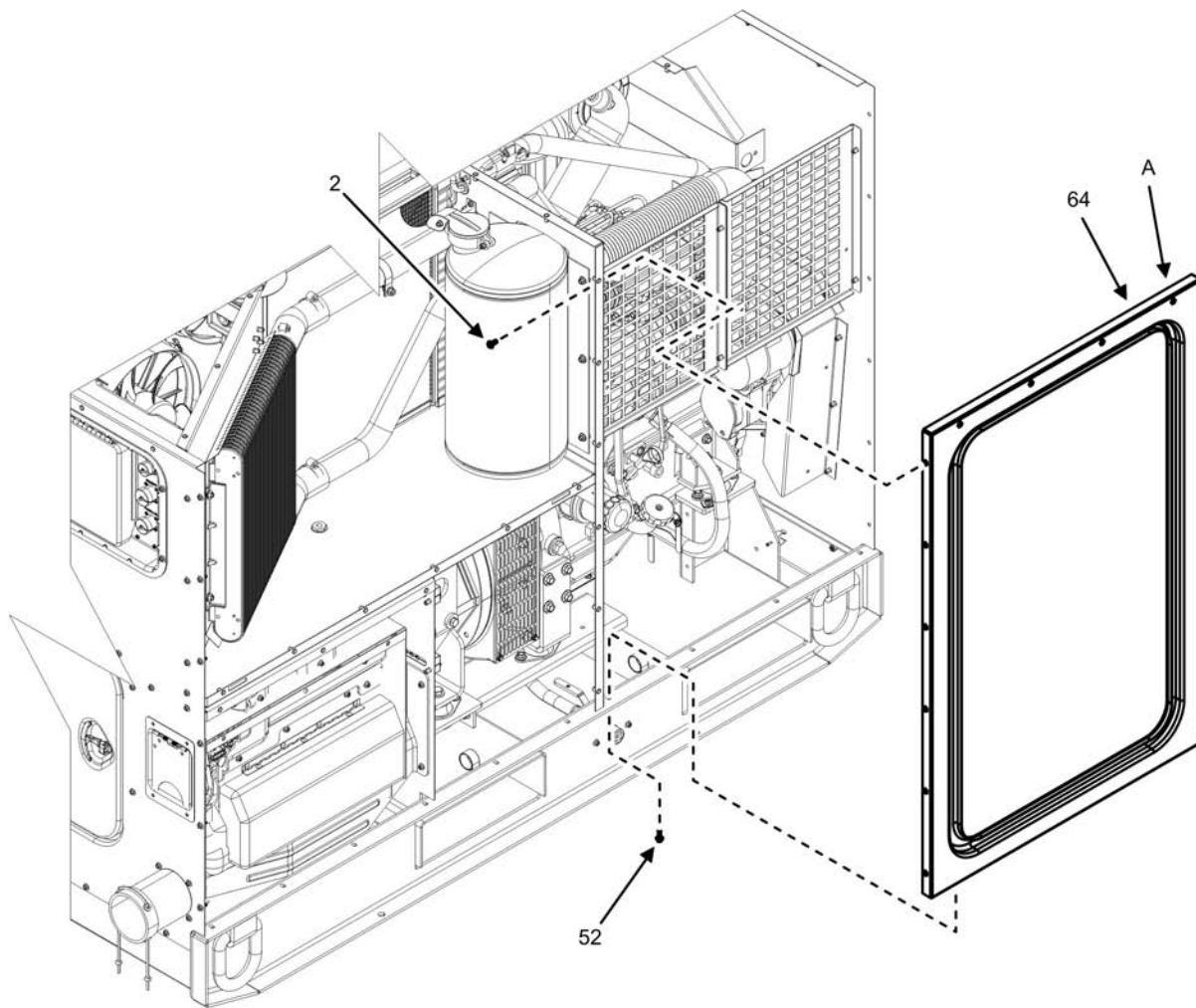


Figure 4. Housing Installation (Sheet 12 of 16, Right-Side Shown).

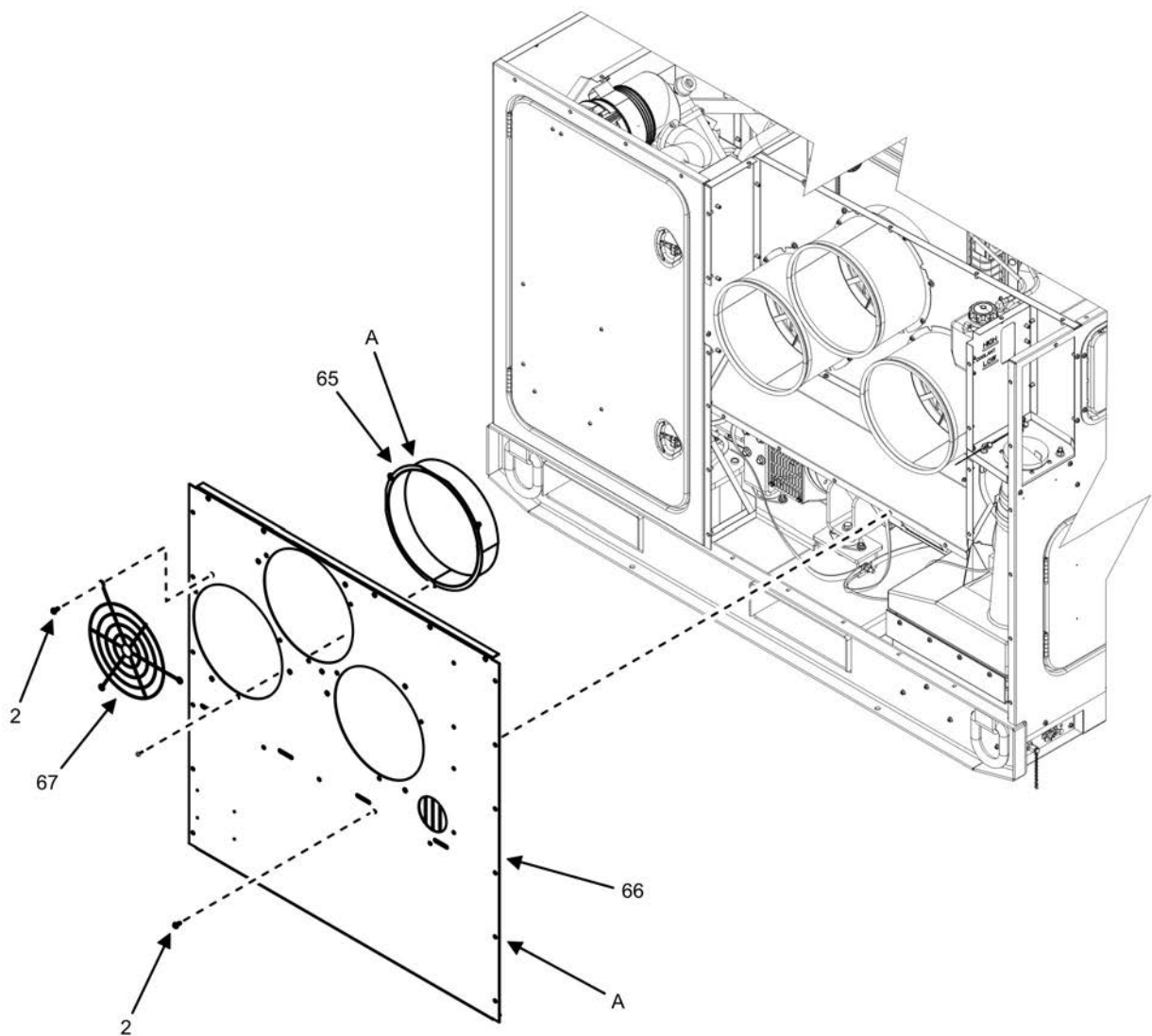


Figure 4. Housing Installation (Sheet 13 of 16).

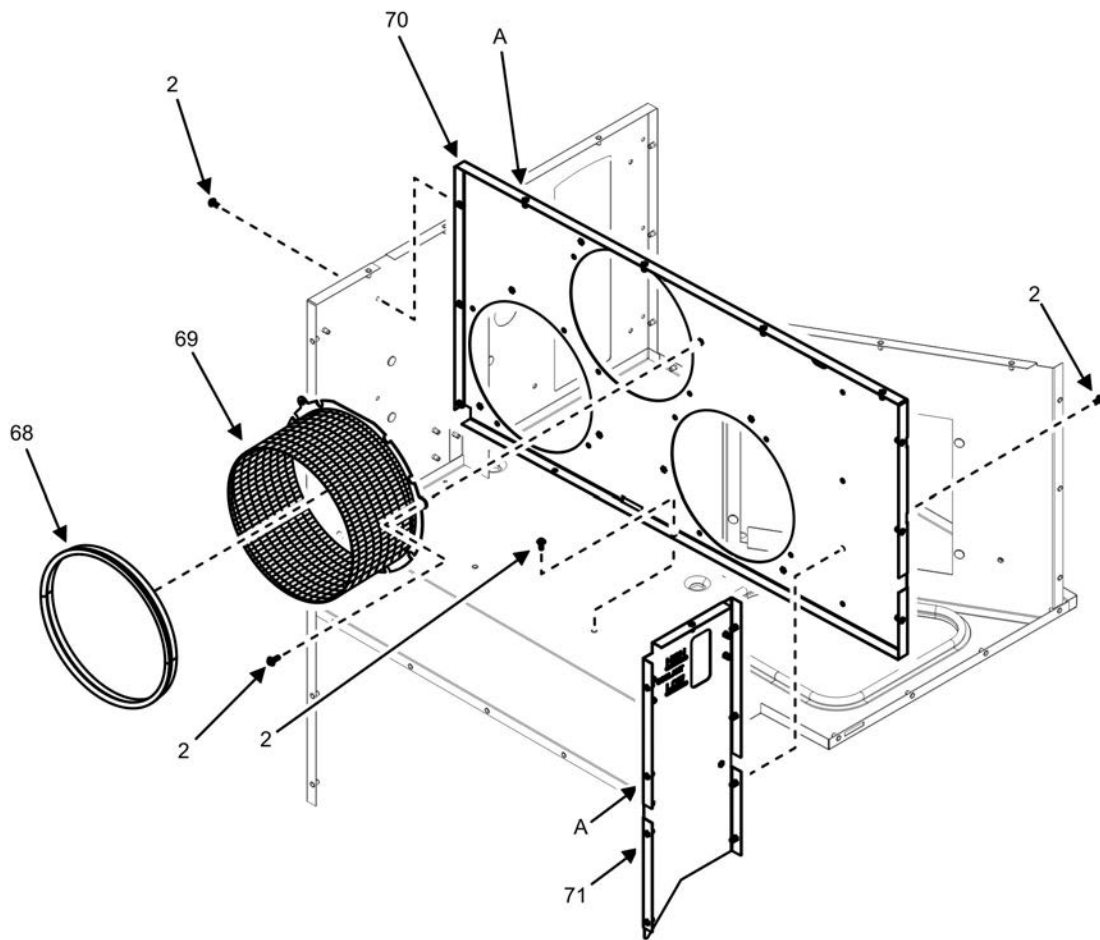


Figure 4. Housing Installation (Sheet 14 of 16).

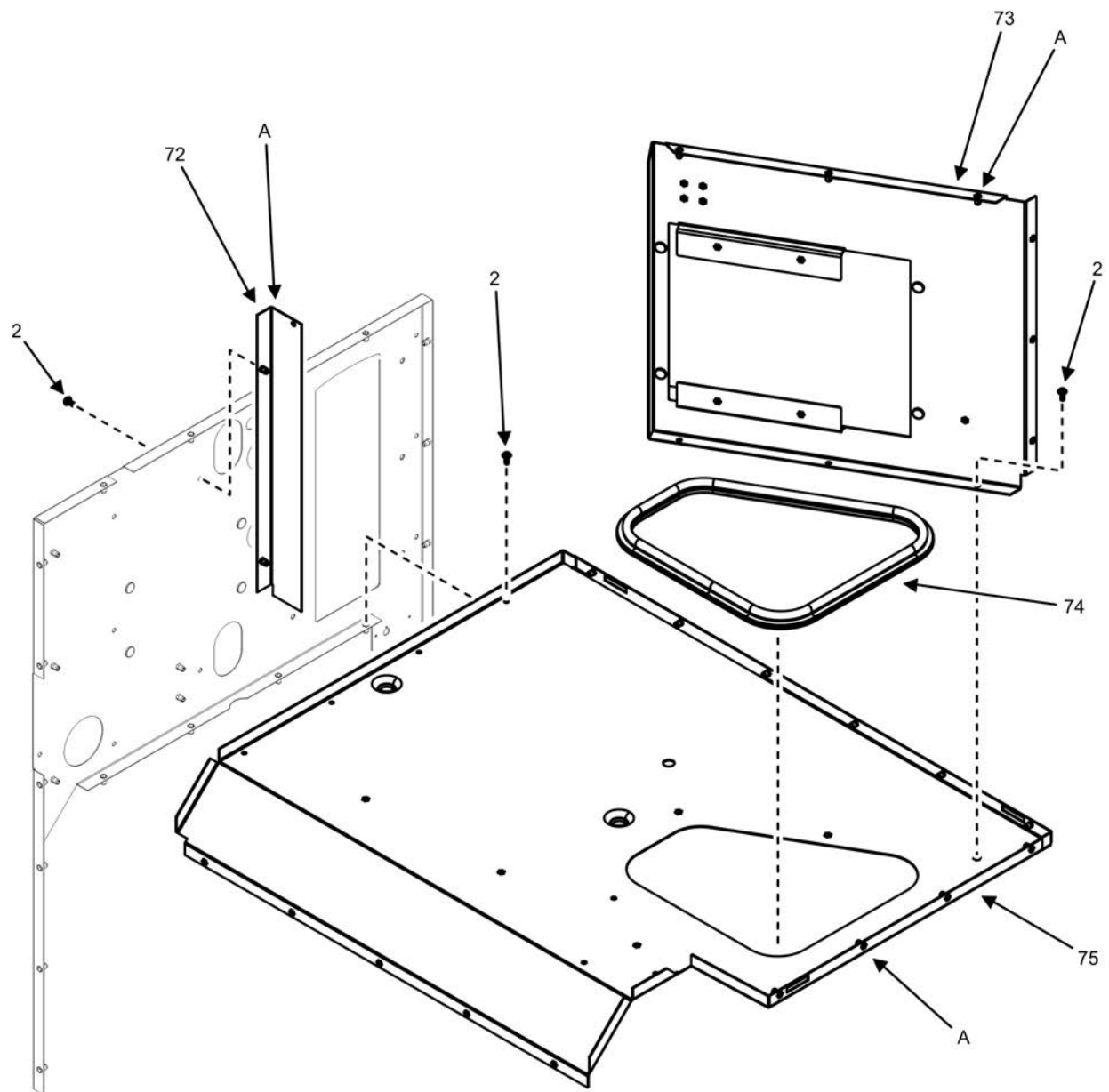


Figure 4. Housing Installation (Sheet 15 of 16).

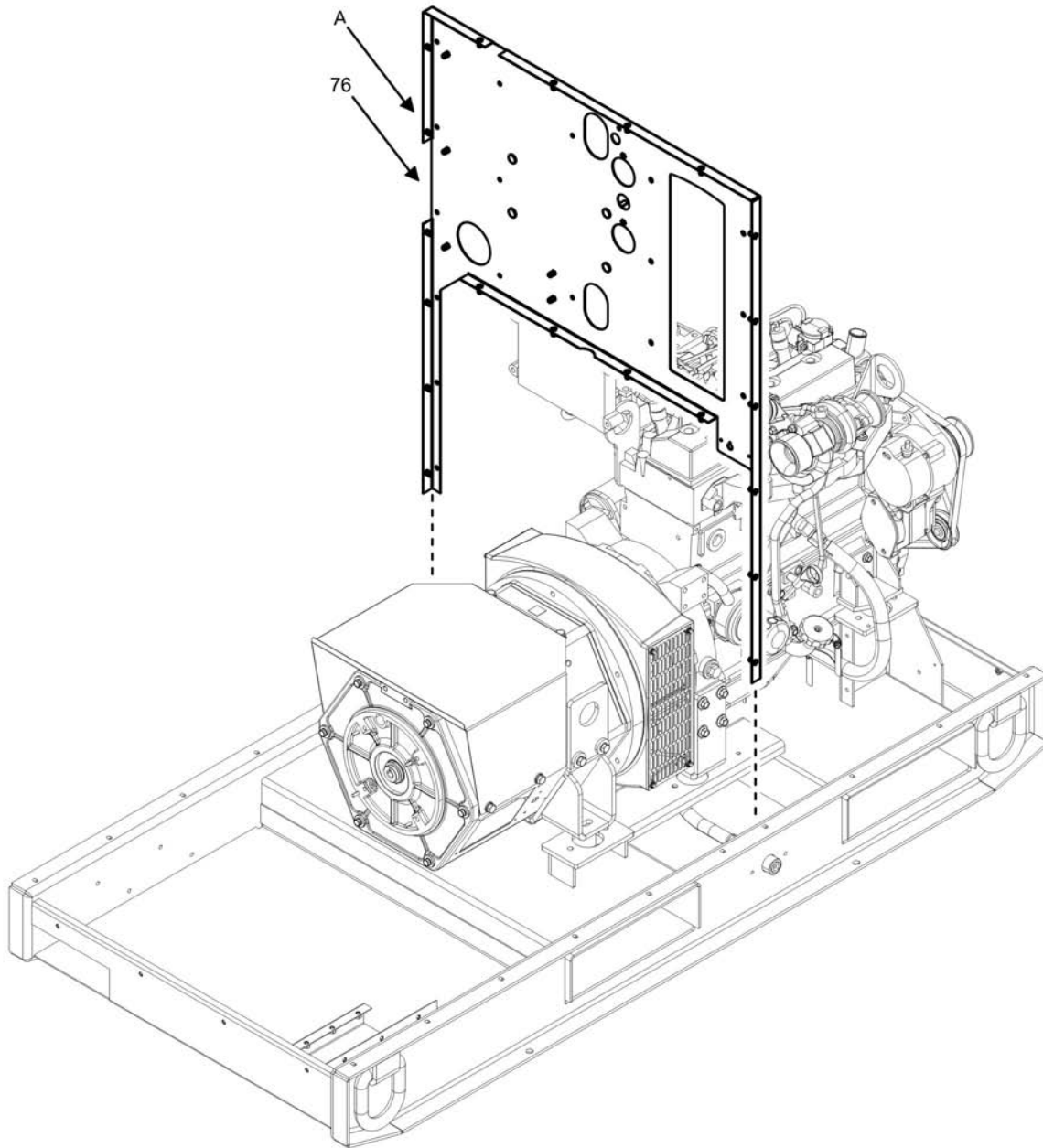


Figure 4. Housing Installation (Sheet 16 of 16).



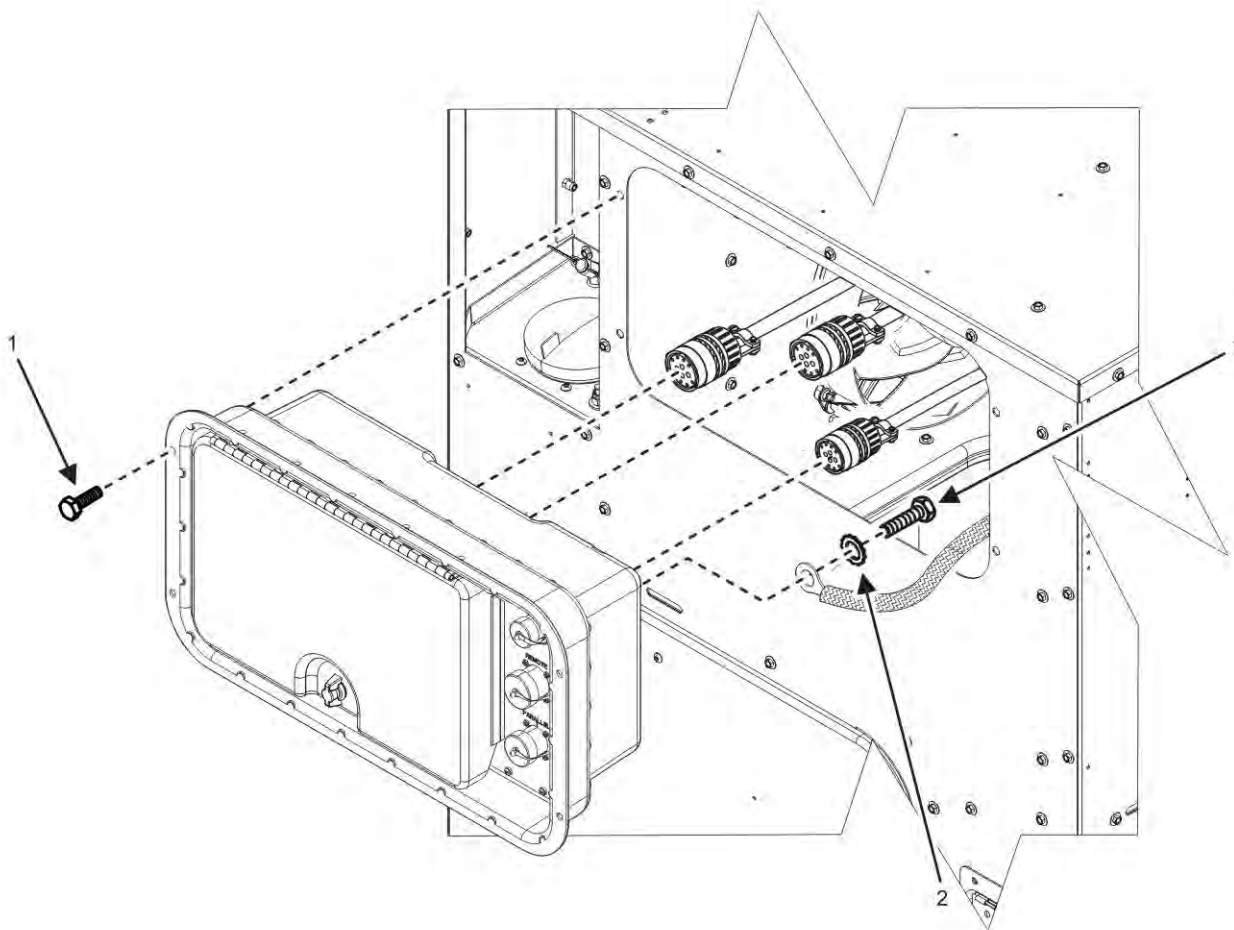
(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 02	
								FIG. 4 HOUSING INSTALLATION	
1	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21350	.ROOF, ENCLOSURE	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		4M343	44832	.SCREW, FLANGE HEAD, M6	181
3	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21391	.GUARD, EXHAUST	2
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893727	3A2G6	39101-76030	.NUT, PLAIN, CLINCH	236
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A016WB4K42	.SCREW, HEX FLANGE HEAD M6 X 1 X 25	2
6	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20021	.DUCT, AIR, CENTER	1
7	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21336	.GUARD, BELT, RH	1
8	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21337	.GUARD, BELT, LH	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		46384	S-M4-1ZI	.NUT, PLAIN, CLINCH	3
10	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21466	.BRACKET, TOP, GROUND	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5320009321972	81349	M24243/6-A402H	.RIVET, BLIND	2
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340014681767	94222	K3-2347-52	.CATCH, CLAMPING	1
13	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21465	.BRACKET, BOTTOM, GROUND	1
14	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21592	.PANEL, ACCESS	1
15	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21193	.PANEL, ENCLOSURE, FRONT	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW23X06R10MSE4A31	.WASHER, FLAT	24
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015889321	3A054	90278A331	.SCREW, SHOULDER	12
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN7380A2-M6X12	.SCREW, CAP, SOCKET HEAD	62
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015971380	44940	04-21081	.BRACKET, DOOR STAY	3
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	.NUT, PLAIN, EXTENDED, M6	66
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3040015971148	44940	04-21076	.LINK, DOOR	4
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEN04M508000CX0A36	.NUT, SELF- LOCKING, HEX	12
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4910015893803	44940	04-21074	.BRACE, DOOR STAY, TOP	4
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4910015893807	44940	04-21075	.BRACE, DOOR STAY, BOTTOM	4
25	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20290	.PLATE, RETAINER, MOUNTING	1
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5365015900371	30554	69-570-2	.BUSHING, ELECTRICAL, SOCK	1
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2920013882776	30554	88-20218	.SLEEVE, TUBE	1
28	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21276-2	.SEAL, EDGE (MAKE FROM A1512 ON BULK ITEM LIST CUT TO LENGTH 1735 MM +/- 5)	2
29	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21842	.PLATE, NUT	1
30	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20602	.DOOR ASSEMBLY	1
31	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20398	.HINGE	8

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015973082	44940	04-21072	..BRACKET, DOOR STAY, SMALL	4
33	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015900063	44940	04-20306	..DOOR, ACCESS	1
34	PAFZZ	PAFZZ	PAFZZ	PAFZZ		S8812	8-325-82	..LATCH	6
35	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21153-4	..LEAD, ELECTRICAL	3
36	PAFZZ	PAFZZ	PAFZZ	PAFZZ		00779	130207	..TERMINAL, LUG, 12-10 AWG M10 RING	3
37	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-12-65	..STRAND, WIRE (MAKE FROM 3271-12-65 ON BULK ITEM LIST CUT TO LENGTH 750 MM +/- 25)	3
38	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG2T5-100B	..LAMINATE, LABEL COVER	3
39	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001139828	96906	MS25036-148	..TERMINAL, LUG, 12-10 AWG M6 RING	3
40	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW13X250000GD5A21	..WASHER, LOCK, 1/4, EXT TOOTH	8
41	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21318-02	..STRAP, GROUNDING	4
42	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20015	..PANEL, REAR	1
43	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21311	..BRACKET, OUTPUT BOX DOOR STAY	1
44	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5120013754373	30554	88-21147	..WRENCH, BOX	1
45	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21322	..CORD, LOAD WRENCH	1
46	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940006553318	96906	MS20659-41	..TERMINAL, LUG, M6, 8 AWG	1
47	PAFZZ	PAFZZ	PAFZZ	PAFZZ		4N991	10008-600	..FIBER ROPE ASSEMBLY	1
48	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21271	..DOOR, OUTPUT BOX ASSEMBLY	1
49	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21270	..DOOR, OUTPUT BOX	1
50	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20285	..BRACKET, WRENCH MOUNTING	1
51	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20283	..PANEL, RIGHT, OUTPUT BOX	1
52	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015921168	44940	AES10M06A020WB4K42	..SCREW, HEX FLANGE HEAD M6	20
53	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21748-2	..SEAL, EDGE (MAKE FROM C4643 ON BULK ITEMS LIST CUT TO LENGTH 3060 MM +/-5)	2
54	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20601	..DOOR ASSEMBLY, RIGHT AND LEFT	2
55	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21766	..WASHER, FLAT	4
56	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015914993	44940	04-20312	..DOOR, ENCLOSURE, RIGHT AND LEFT	2
57	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340013960454	94222	97-50-170-11	..CATCH, CLAMPING	2
58	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015006541	3L891	40CNFHS	..NUT, PLAIN, HEXAGON	4

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
59	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015956003	1MMD1	C-04-21420	..SCREW, MACHINE	4
60	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21039	..BOX, TOOL	2
61	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015973073	44940	04-21045	..HINGE, TOOL	
62	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21046	BOX	2
63	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21031-4	..COVER, BOX, TOOL	2
								..SEAL, EDGE (MAKE FROM A1512 ON BULK ITEM LIST CUT TO LENGTH	
64	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20019	259MM +/-3)	2
								..PANEL, LEFT AND RIGHT DOOR	2
65	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21639	..TUBE, AIR INLET	3
66	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21635	..PANEL, LEFT, AIR INTAKE	1
67	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21657	..GUARD, FAN	3
68	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21672	..EDGE, SEAL (MAKE FROM A4025 ON BULK ITEMS LIST CUT TO LENGTH	
								980 MM +/- 5)	3
69	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21638	..DUCT, INLET	3
70	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21360	..PANEL, AIR, FAN	1
71	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21177	..PANEL, SUPPORT, FUEL	1
72	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21627	..SHROUD	1
73	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21265	..BRACKET, MOUNTING, RIGHT SIDE	1
74	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21438-3	..SEAL, WEATHER (MAKE FROM A2539 ON BULK ITEM LIST CUT TO LENGTH	
								920MM +/-5)	1
75	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21534	..PANEL, RADIATOR	1
76	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20023	..CROSSMEMBER, ENCLOSURE	1
END OF FIGURE									



**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**DCS INSTALLATION REPAIR PARTS LIST**



**Figure 5. DCS Installation (Sheet 1 of 3).**

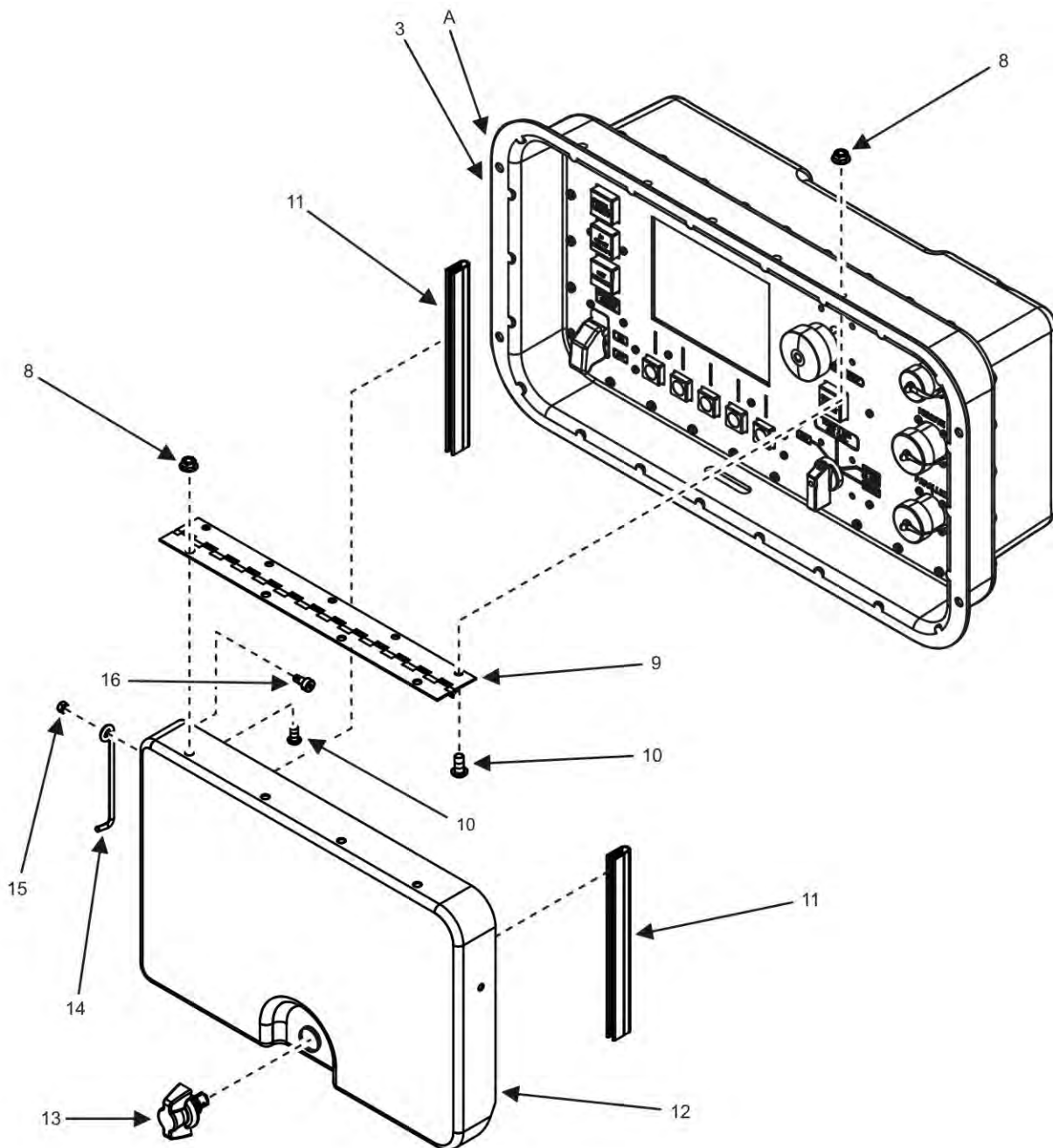


Figure 5. DCS Installation (Sheet 2 of 3).

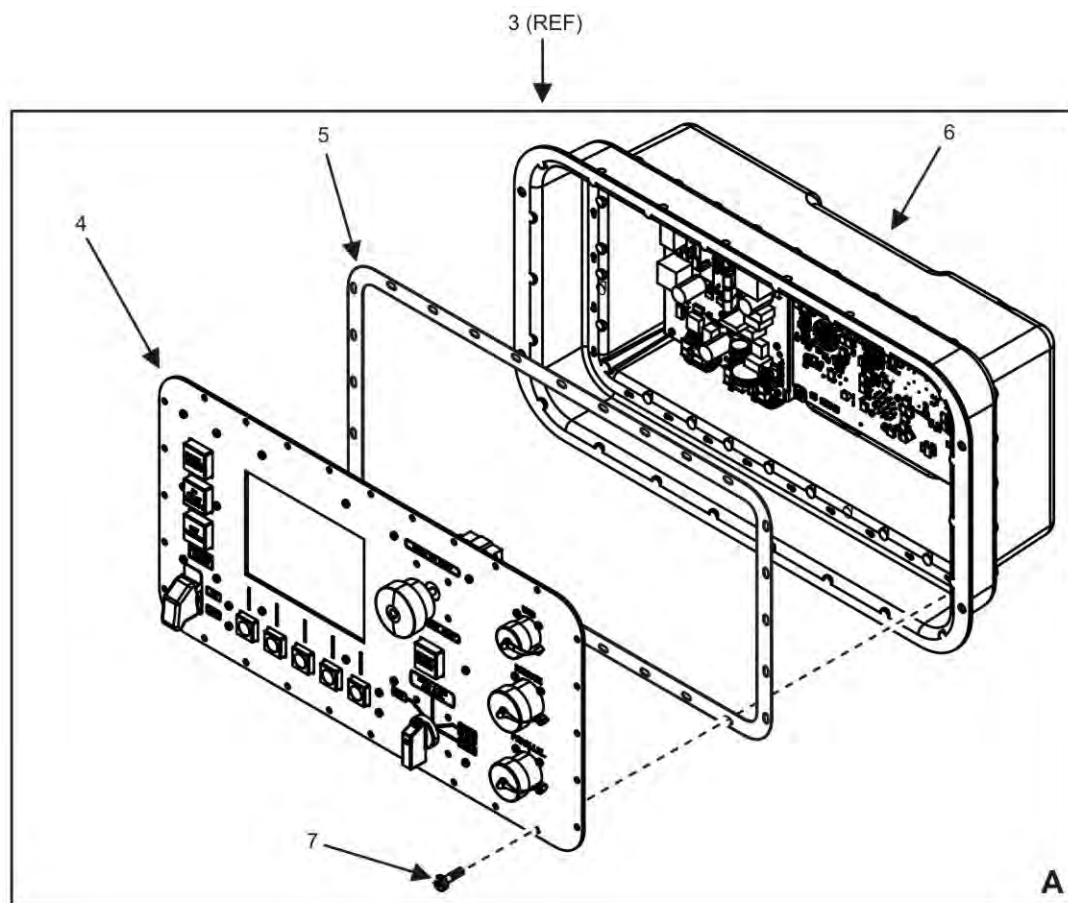


Figure 5. DCS Installation (Sheet 3 of 3).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 03	
								FIG. 5 DCS INSTALLATION	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015921168	44940	AES10M06A020WB4K42	..SCREW, FLANGE HEAD (M6 X 1.0 X 16)	5
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW13X250000GD5A21	..WASHER, LOCK	1
3	PAFHH	PAFHH	PAFFF	PAFFF	6115015884725	44940	04-20442	..CONTROL BOX ASSEMBLY	1
4	XBFHH	XBFHH	XBFFF	XBFFF		44940	04-20414	..PANEL ASSEMBLY, DCS CONTROL (SEE FIGURE 6 FOR PARTS BREAKDOWN)	1
5	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5330015971378	44940	04-21569	..GASKET, CONTROL BOX	1
6	XBFHH	XBFHH	XBFFF	XBFFF		44940	04-20424	..ENCLOSURE ASSEMBLY, DCS (SEE FIGURE 7 FOR PARTS BREAKDOWN)	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015956147	1MMD1	C-04-21421	..SCREW	28
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	..NUT (M6 X 1)	9
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015971379	44940	04-20399	..HINGE	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN7380A2-M6X12	..SCREW (M6 X 12)	9
11	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21031-5	..SEAL, EDGE (MAKE FROM A1512 ON BULK ITEMS LIST)	2
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015971375	44940	04-20313	..DOOR	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015899988	S8812	8-325-88	..LATCH	1
14	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20880	..BRACKET, SUPPORT	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEN045M508000CX0A36	..NUT, LOCK	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015889321	3A054	90278A331	..SCREW, SHOULDER (M5 X 0.8 X 12)	1
								END OF FIGURE	



FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
DCS CONTROL PANEL ASSEMBLY REPAIR PARTS LIST

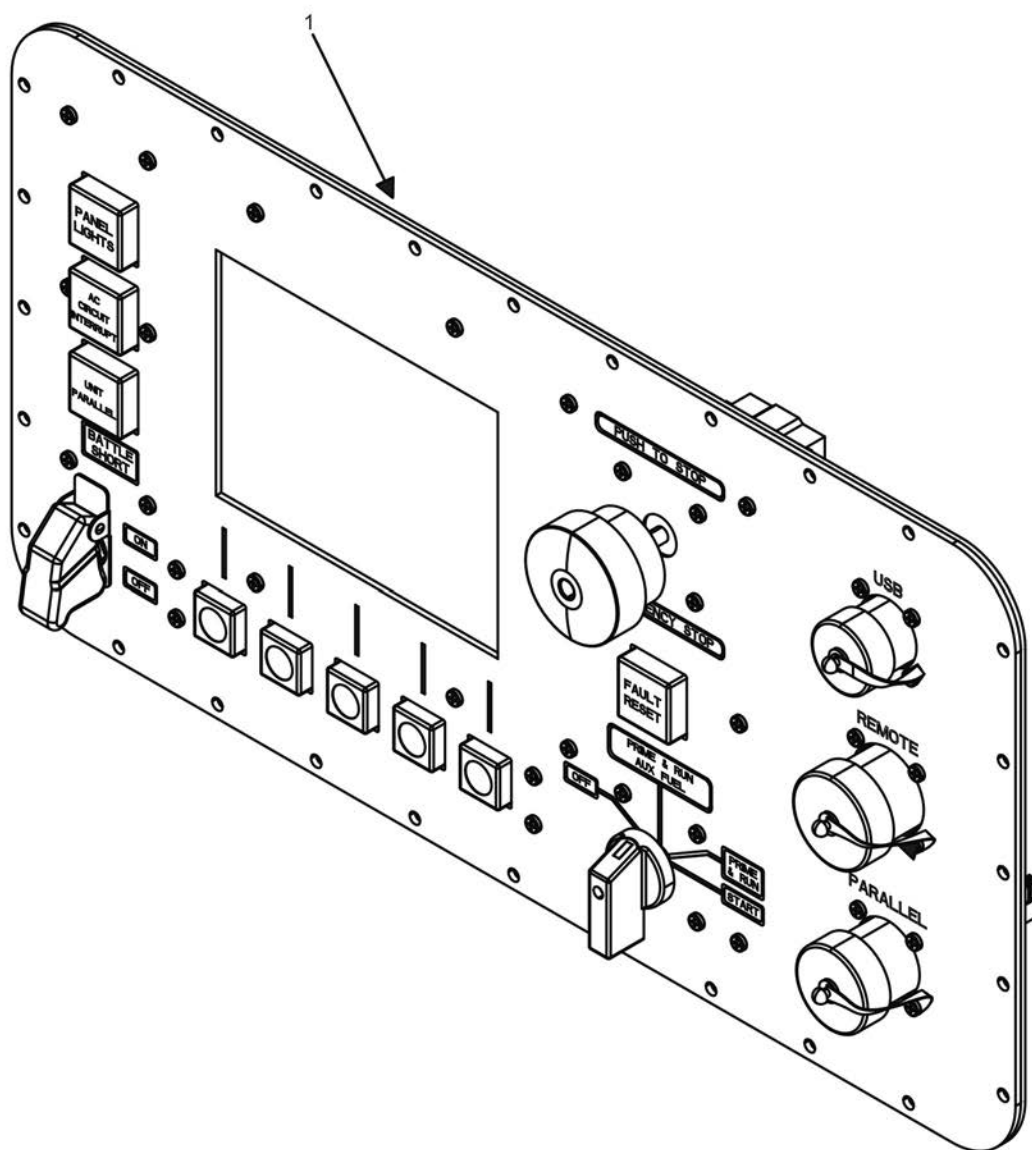


Figure 6. DCS Control Panel Assembly (Sheet 1 of 6).

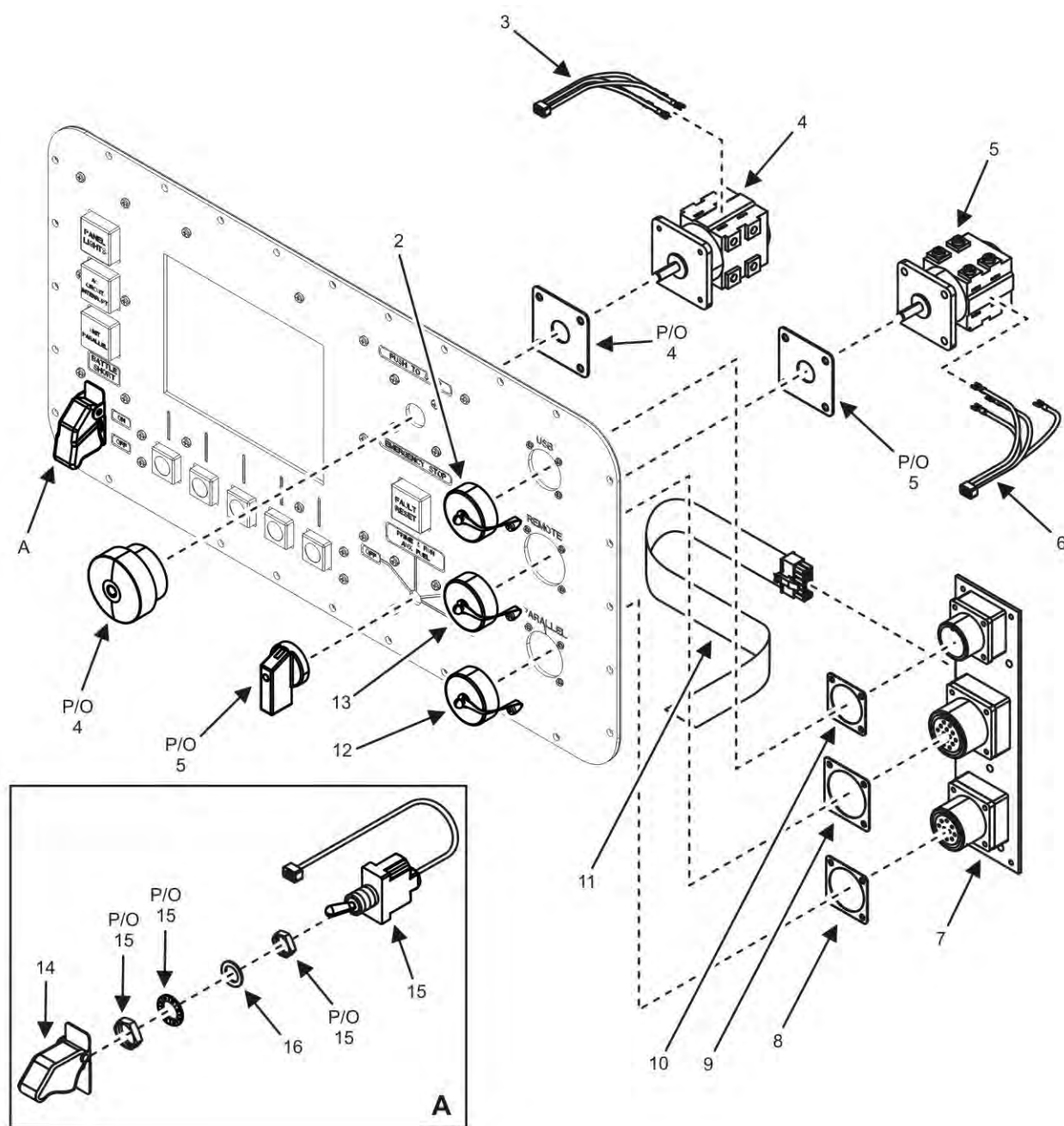


Figure 6. DCS Control Panel Assembly (Sheet 2 of 6).

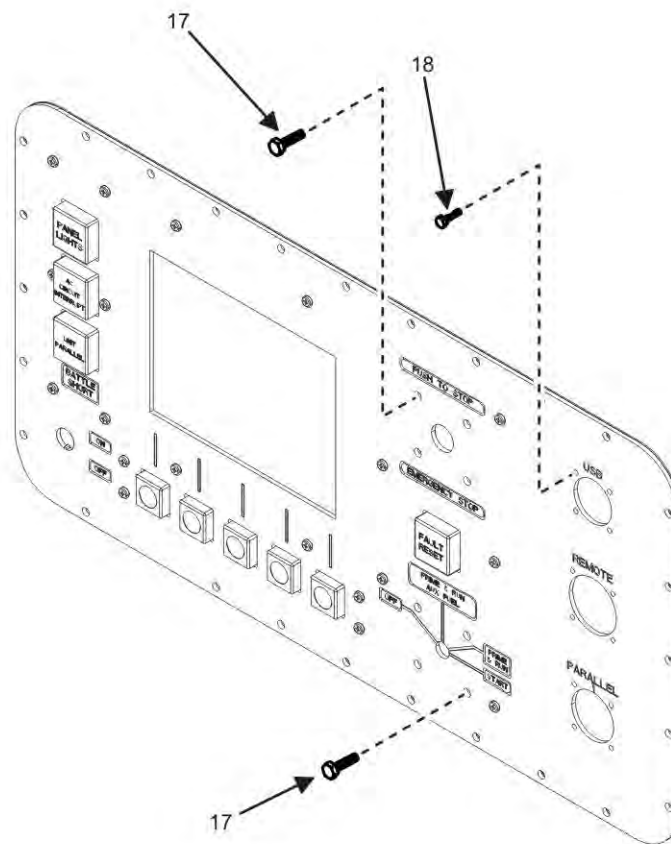


Figure 6. DCS Control Panel Assembly (Sheet 3 of 6).

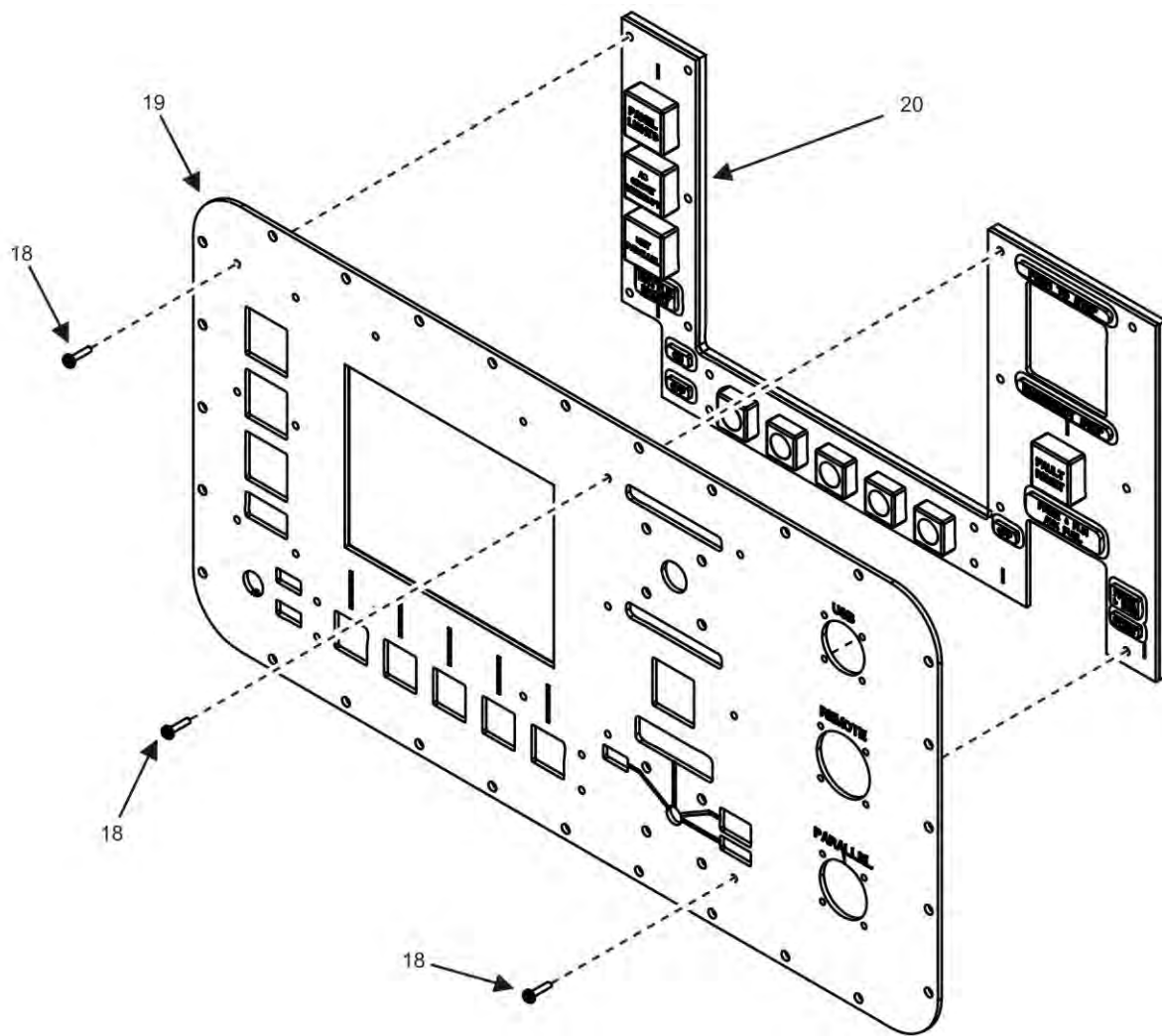


Figure 6. DCS Control Panel Assembly (Sheet 4 of 6).

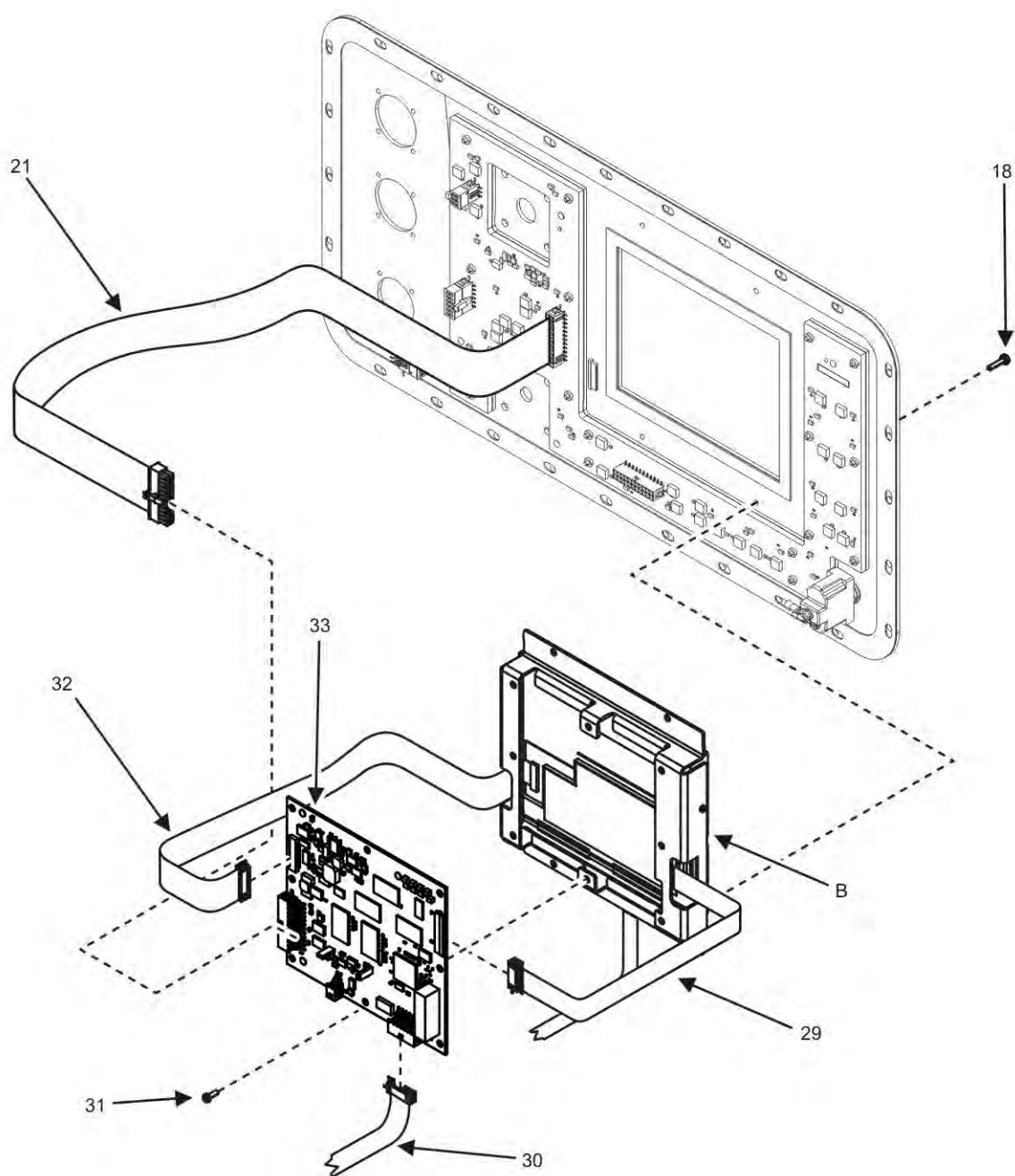


Figure 6. DCS Control Panel Assembly (Sheet 5 of 6).

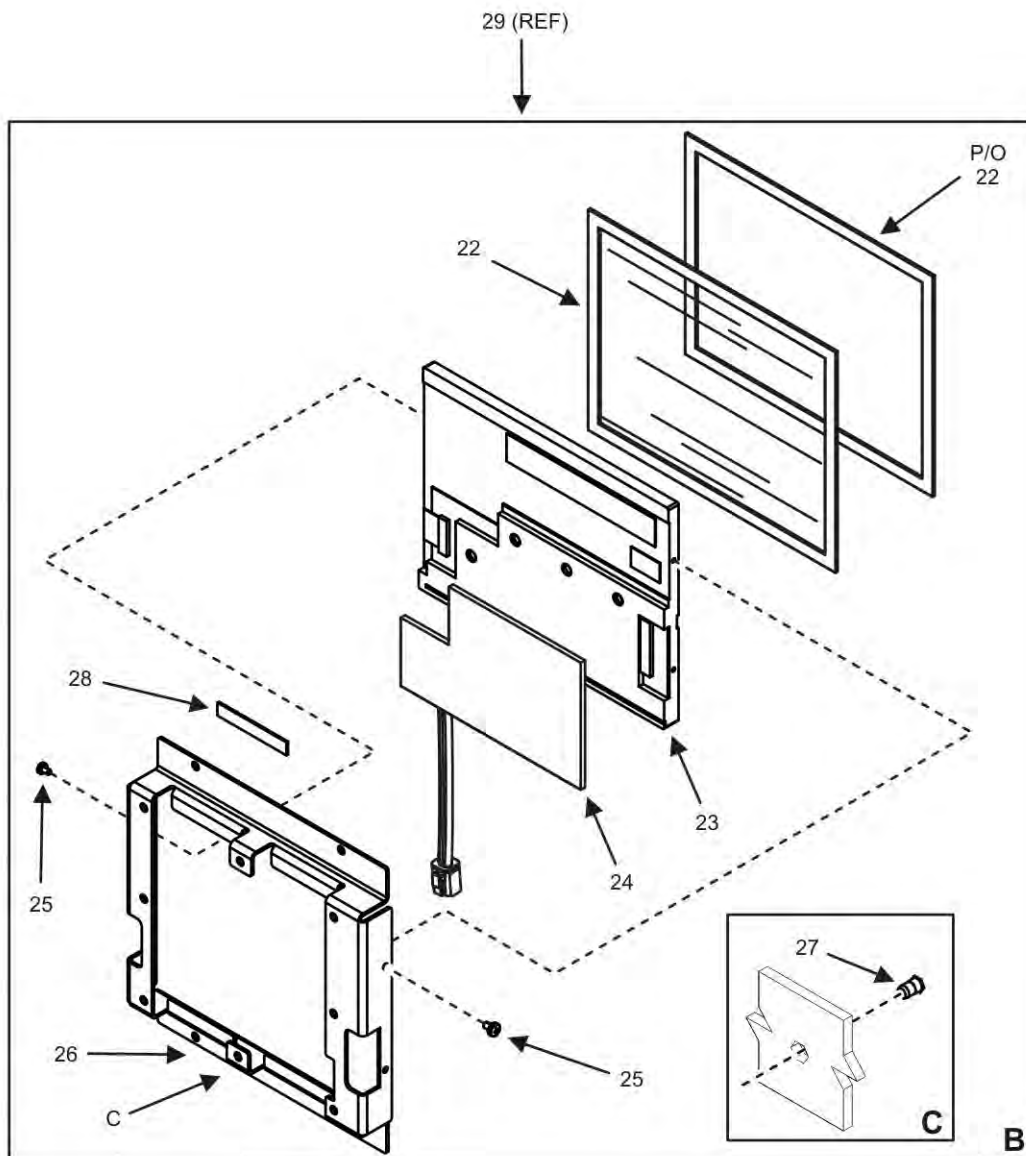


Figure 6. DCS Control Panel Assembly (Sheet 6 of 6).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0301	
								FIG. 6 DCS CONTROL PANEL ASSEMBLY	
1	XBFHH	XBFHH	XBFFF	XBFFF		44940	04-20414	..PANEL ASSEMBLY, DCS CONTROL	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	MS25043-16DA	..CAP	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6150015885621	44940	04-20422	..CABLE ASSEMBLY, EMERGENCY STOP SWITCH	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		DKR12	US0094#02#EA	..SWITCH, EMERGENCY STOP (INCLUDES GASKET AND KNOB)	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		D4R12	US9206#01 EFI	..SWITCH, ENGINE CONTROL (INCLUDES GASKET AND KNOB)	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6150015885606	44940	04-20421	..CABLE ASSEMBLY, ENGINE CONTROL SWITCH	1
7	PAHZZ	PAHZZ	PAFZZ	PAFZZ		44940	A206D375	..CARD, CONTROL CONNECTOR	1
8	PAFZZ	PAFZZ	PAHZZ	PAHZZ	5330015956467	37GZ4	A026J180	..GASKET	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015894656	37GZ4	A026J182	..GASKET	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015956168	37GZ4	A026J177	..GASKET	1
11	PAHZZ	PAHZZ	PAFZZ	PAFZZ	6150015886024	44940	04-20441	..CABLE ASSEMBLY (J203 TO J304)	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015901601	44940	MS25043-18DW	..CAP	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	MS25043-20DA	..CAP	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5930006156731	96906	MS25224-1	..GUARD, SWITCH	1
15	PAFFF	PAFFF	PAFZZ	PAFZZ	5930015894070	44940	04-20385	..SWITCH, BATTLESORT	1
16	PAFZZ	PAFZZ	PAFFF	PAFFF	5310015935320	5P209	60225	...RING, SEALING	1
17	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5305015961447	44940	04-21701	...SCREW, THREAD- FORMING PANHEAD (10-16 TYPE B)	8
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0XDB0	A030A105	...SCREW, PAN HEAD (4-40 UNC X 0.5)	32
19	XBHZZ	XBHZZ	XBHZZ	XBHZZ		44940	04-20181	..PANEL, CONTROL	1
20	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5915015971364	44940	04-21242	..MEMBRANE ASSEMBLY	1
21	PAHZZ	PAHZZ	PAFZZ	PAFZZ	6150015885631	44940	04-21058	..CABLE ASSEMBLY (J201 TO J404)	1
22	PAHZZ	PAHZZ	PAHZZ	PAHZZ	6110015859960	37GZ4	A030D423	..PANEL, CONTROL, LCD GLASS	1
23	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5980015873102	SCR39	NL6448BC20-21C	..DISPLAY, LCD	1

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
24	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5340015894472	79221	A026G053	.HEATER, PANEL (INCLUDES CABLE)	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN7985-M2X3	.SCREW, PAN HEAD (M2 X 3.0)	4
26	XBHHH	XBHHH	XBFFF	XBFFF		44940	04-20969	.BRACKET, MOUNTING	1
27	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5310003382255	81349	M45938-1-4C	.NUT, PLAIN, CLINCH	12
28	PCFZZ	PCFZZ	PAHZZ	PAHZZ	5330015876259	37GZ4	A026B892	.GASKET	4
29	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5935015885541	44940	04-20411	.CABLE ASSEMBLY, DISPLAY COMMUNICATION (LCD DISPLAY TO J402)	1
30	PAHZZ	PAHZZ	PAFZZ	PAFZZ	6150015884000	44940	04-20437	.CABLE ASSEMBLY J104 TO J403	1
31	PAFZZ	PAFZZ	PAHZZ	PAHZZ		44940	AESF5C112312WA2A26	.SCREW, PAN HEAD (4-40 UNC X 0.31)	8
32	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5935015885600	44940	04-20412	.CABLE, ASSEMBLY DISPLAY BACKLIGHT (LCD DISPLAY TO J401)	1
33	PAHZZ	PAHZZ	PAHZZ	PAHZZ	5998015887279	44940	A026D370	.CARD, CONTROL, DISPLAY	1
END OF FIGURE									



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FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
DCS ENCLOSURE ASSEMBLY REPAIR PARTS LIST

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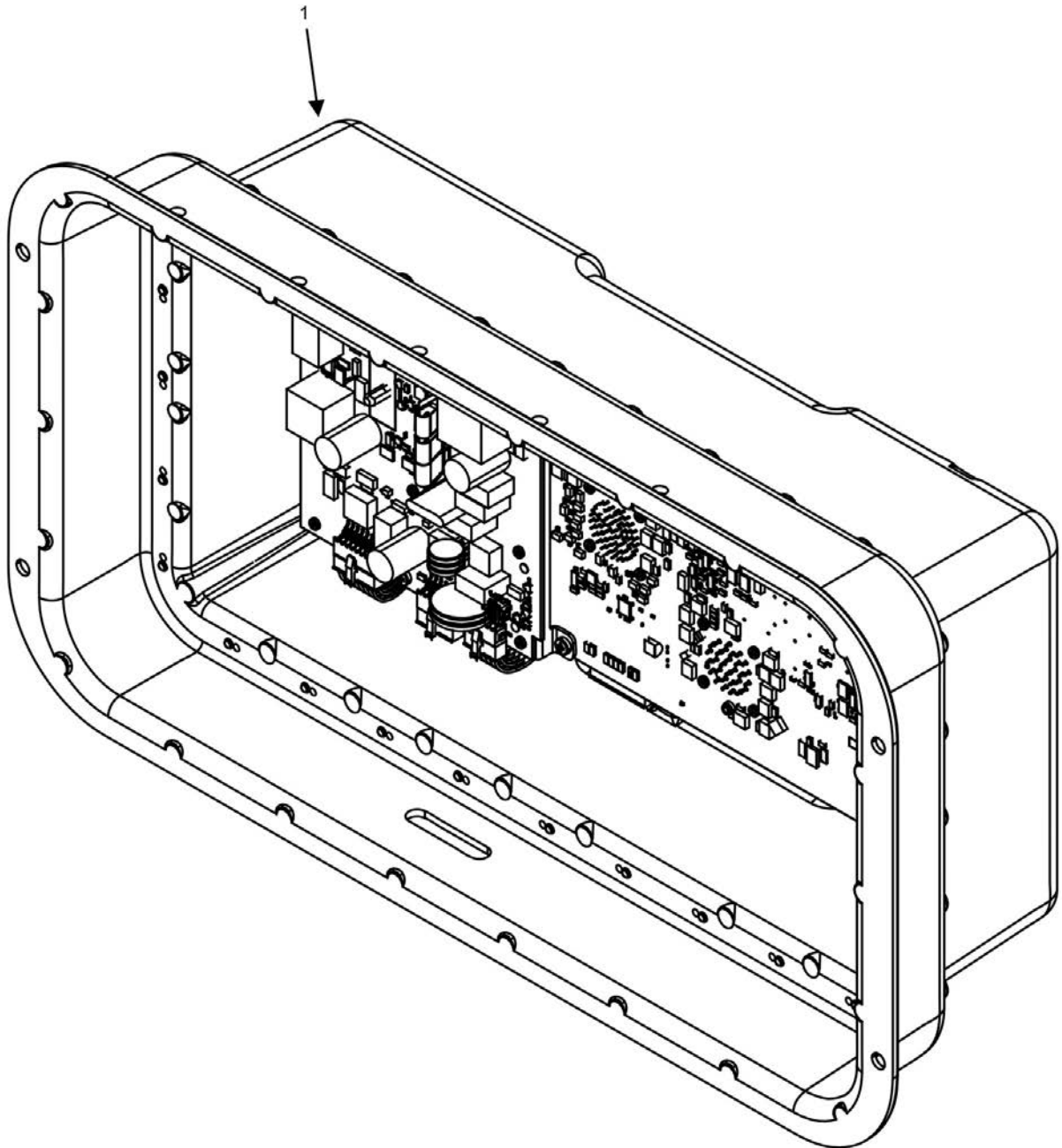


Figure 7. DCS Enclosure Assembly (Sheet 1 of 3).

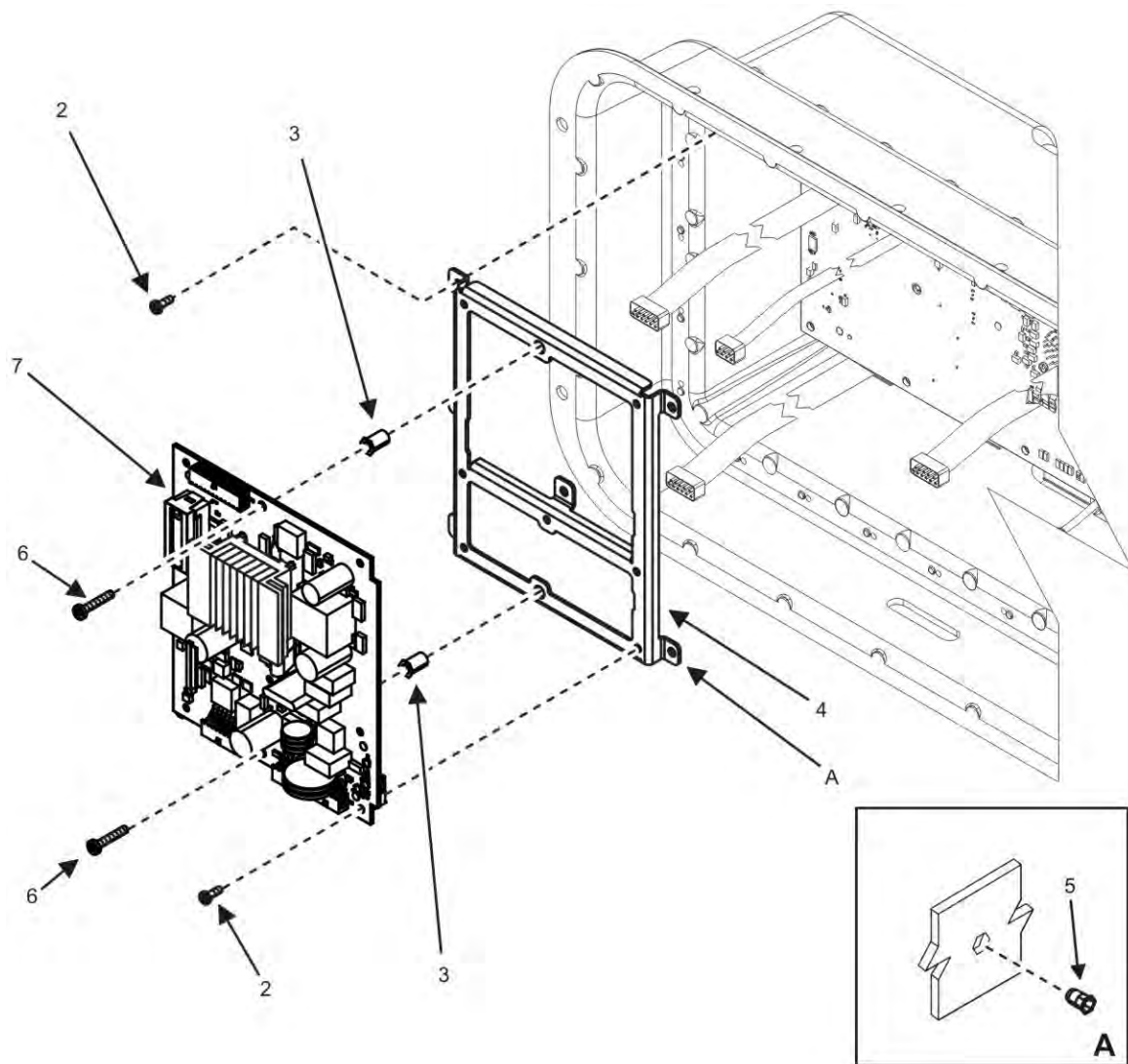


Figure 7. DCS Enclosure Assembly (Sheet 2 of 3).

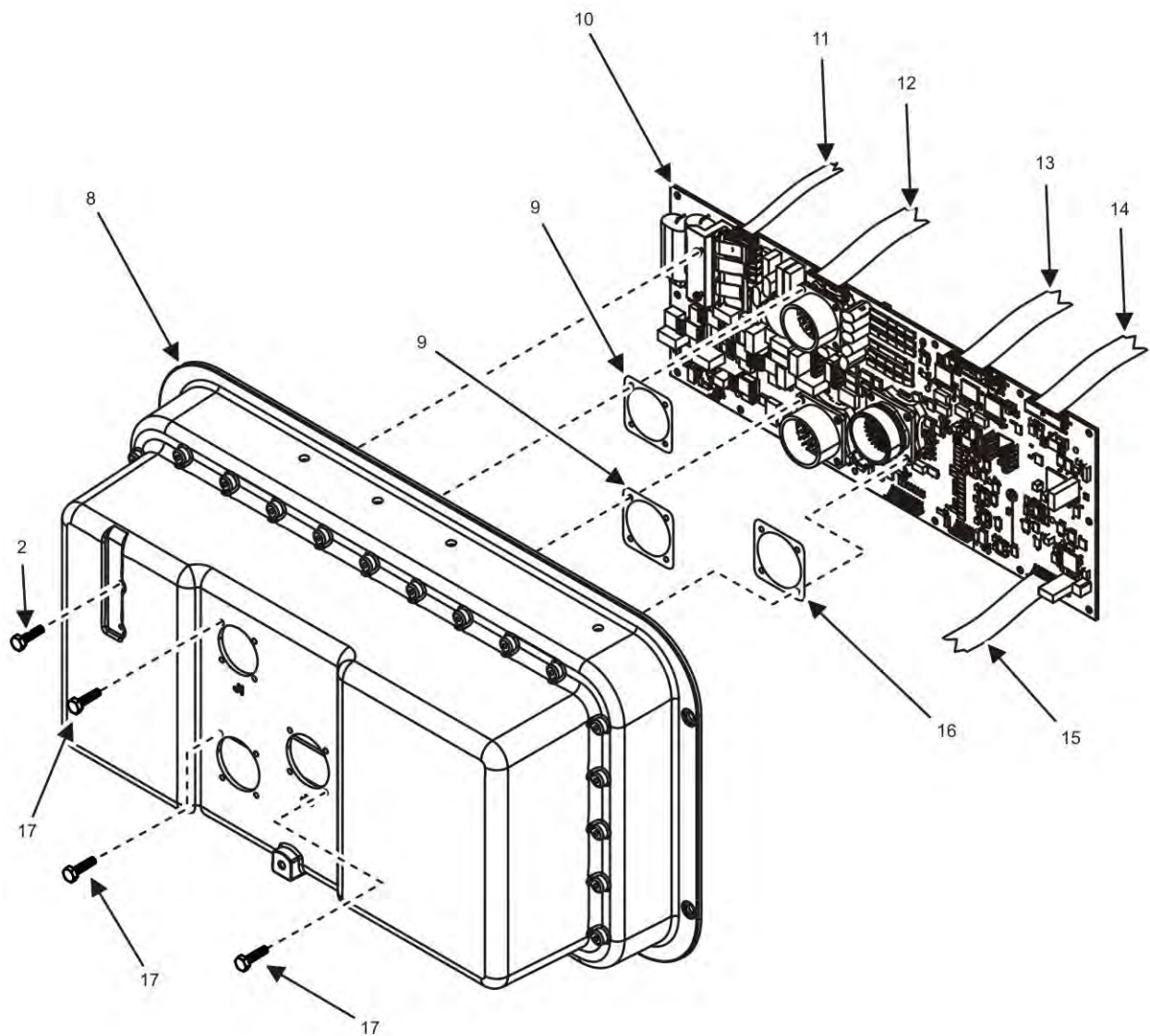


Figure 7. DCS Enclosure Assembly (Sheet 3 of 3).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
GROUP 0302								
FIG. 7 DCS ENCLOSURE ASSEMBLY								
1	XBFHH	XBFHH	XBFFF	XBFFF		44940	04-20424	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015956003	MMD1C	04-21420	12
3	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5340015883111	46384	SOS-85.1-12	2
4	XBHHH	XBHHH	XBFFF	XBFFF		44940	04-21402	1

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
5	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5310003382255	81349	M45938-1-4C	...NUT, PLAIN, CLINCH	7
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015956010	44940	04-21422	..SCREW, PAN HEAD (M4 X 22)	2
7	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5998015887145	44940	A026D949	..CARD, CONTROL, POWER	1
8	XBHZZ	XBHZZ	XBHZZ	XBHZZ		44940	04-20650	..BOX, CONTROL	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015900070	37GZ4	A026E709	..GASKET	2
10	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5998015877618	44940	A026F215	..CARD, CONTROL, MAIN	1
11	PAHZZ	PAHZZ	PAHZZ	PAHZZ	6150015885253	44940	04-20439	..CABLE ASSEMBLY J17 TO J305	1
12	PAHZZ	PAHZZ	PAHZZ	PAHZZ	6150015885103	44940	04-20438	..CABLE ASSEMBLY J15 TO J202	1
13	PAHZZ	PAHZZ	PAFZZ	PAFZZ	6150015883995	44940	04-20436	..CABLE, ASSEMBLY (J9 TO J101)	1
14	PAHZZ	PAHZZ	PAFZZ	PAFZZ	6150015883992	44940	04-20434	..CABLE, ASSEMBLY (J13 TO J103)	1
15	PAHZZ	PAHZZ	PAFZZ	PAFZZ	6150015883988	44940	04-20435	..CABLE, ASSEMBLY (J11 TO J102)	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015956135	37GZ4	A026E707	..GASKET	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21626	..SCREW (6-32)	12
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
INTAKE AIR INSTALLATION REPAIR PARTS LIST

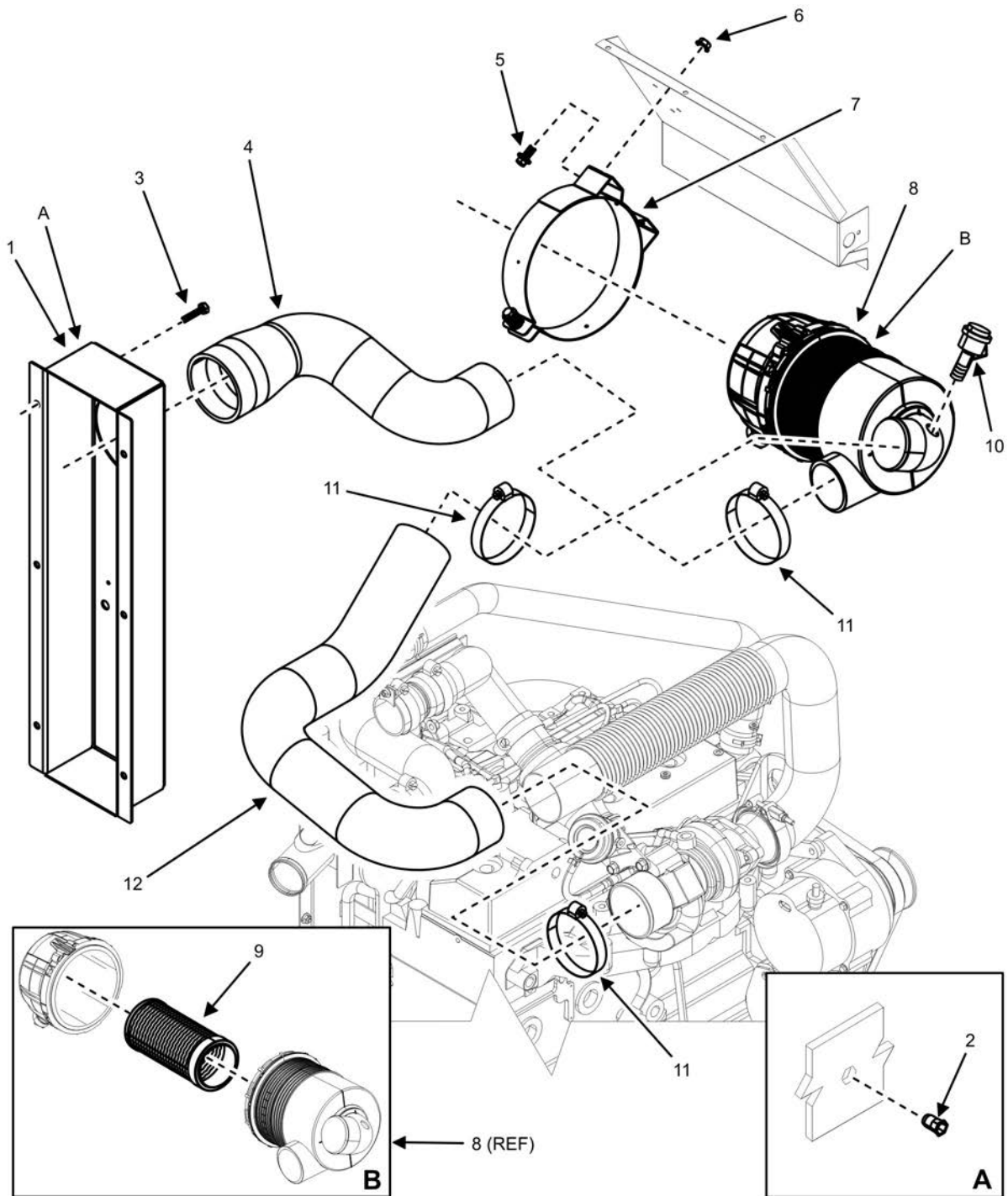


Figure 8. Intake Air Installation (Sheet 1 of 2).

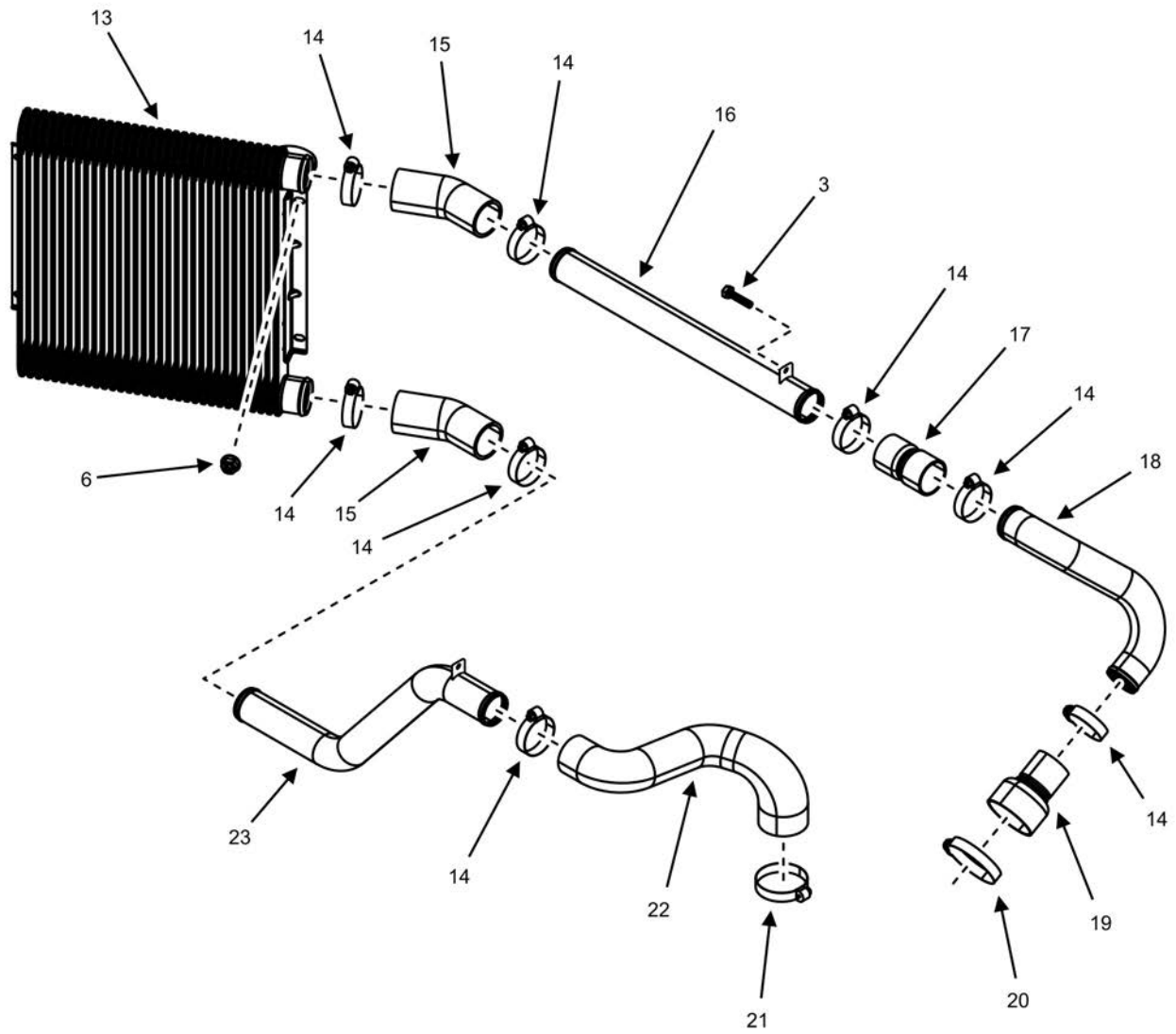


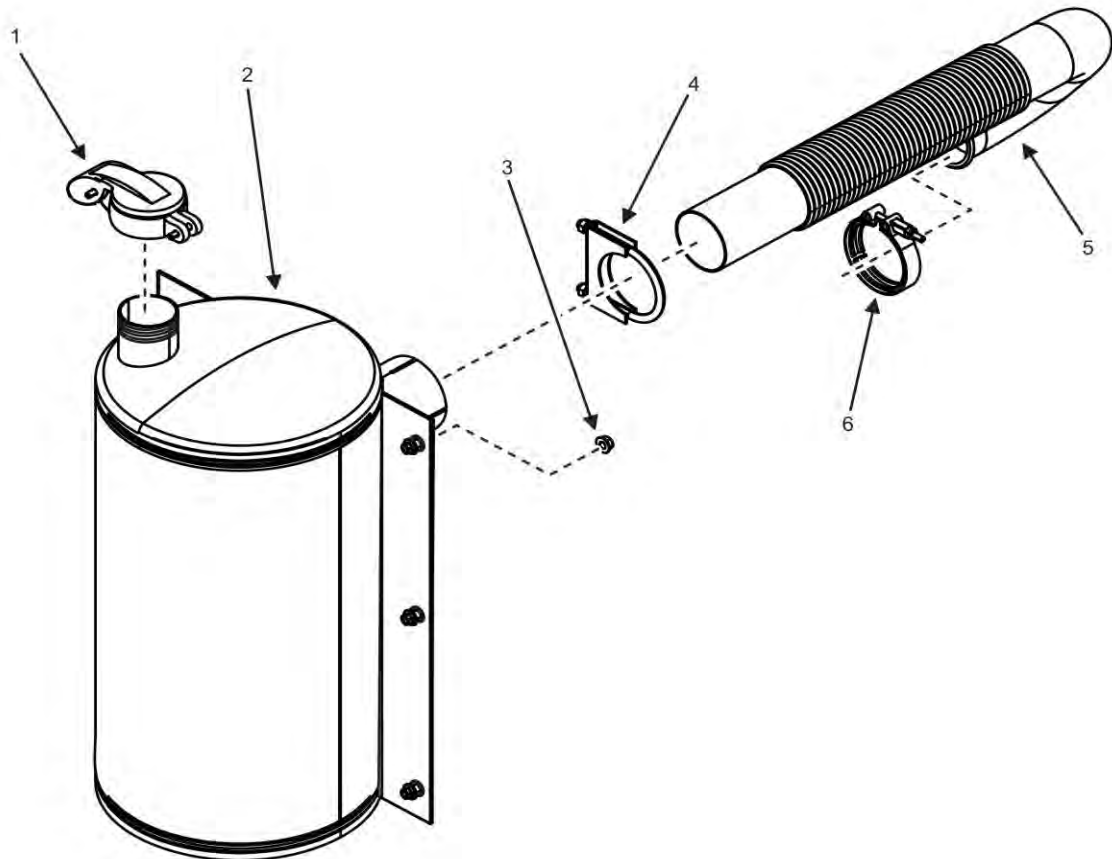
Figure 8. Intake Air Installation (Sheet 2 of 2).

(1)	(2)			(3)		(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
									GROUP 04	
									FIG. 8 INTAKE AIR INSTALLATION	
1	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21268		.BRACKET, DUCT	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893727	3A2G6	39101-76030		..NUT, PLAIN, CLINCH	2
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015921168	05047	AES10M06A016WB4K42		.SCREW, FLANGE HEAD M6 X 1.0 X 16, SST A2-70	7
4	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4720015956776	44940	04-21089		.HOSE, AIR	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M08B016WB4K42		.SCREW, HEX FLANGE HEAD M8 X 1.25 X 16	4
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M8		.NUT, HEX FLANGE M8 X 1.25	8
7	XBFZZ	XBFZZ	XBFZZ	XBFZZ		33457	3918196S		.CLAMP, AIR CLEANER	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		33457	AH1948900		.AIR CLEANER 30KW	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		33457	AF26117		...ELEMENT, AIR FILTER	1
10	PAFZZZ	PAFZZ	PAFZZZ	PAFZZ		33457	Q065571-10		.INDICATOR, SERVICE, AIR CLEANER	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAE1508F56		.CLAMP	3
12	PCFZZ	PCFZZ	PCFZZ	PCFZZ	2815015908820	44940	04-21088		.HOSE, AIR	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ		U3272	MN127100-3761		.COOLER, CHARGE AIR	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508SLF36		.CLAMP-HOSE	8
15	PCFZZ	PCFZZ	PCFZZ	PCFZZ		16632	CUM1198		.TUBE, FLEXIBLE	2
16	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21086		.TUBE, CHARGE AIR COOLER	1
17	PCFZZ	PCFZZ	PCFZZ	PCFZZ		16632	CUM1196		.CONNECTOR, TUBE	1
18	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21127		.TUBE, CHARGE AIR COOLER	1
19	PCFZZ	PCFZZ	PCFZZ	PCFZZ		16632	CUM1199		.CONNECTOR, TUBE	1
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508SLF52		.CLAMP-HOSE	1
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508SLF44		.CLAMP-HOSE	1
22	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4720015973414		04-20976		.HOSE, AIR	1
23	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21087		.TUBE, CHARGE AIR COOLER	1
END OF FIGURE										





**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**EXHAUST INSTALLATION REPAIR PARTS LIST**



**Figure 9. Exhaust Installation.**

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM	ARMY	SMR CODE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
NO.		AIR FORCE							
GROUP 05									
FIG. 9 EXHAUST INSTALLATION									
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		64721	8X	.CAP, RAIN EXHAUST	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2815015915186	44940	202232A	.MUFFLER 30 KW	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M8	.NUT, HEX FLANGE (M8X1.25)	6
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015894823	14934	UD0275A1	.CLAMP, EXHAUST	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20049	.PIPE, EXHAUST	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015955878	7Z588	VT10321	.CLAMP, V	1
END OF FIGURE									



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**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
COOLING SYSTEM INSTALLATION REPAIR PARTS LIST**

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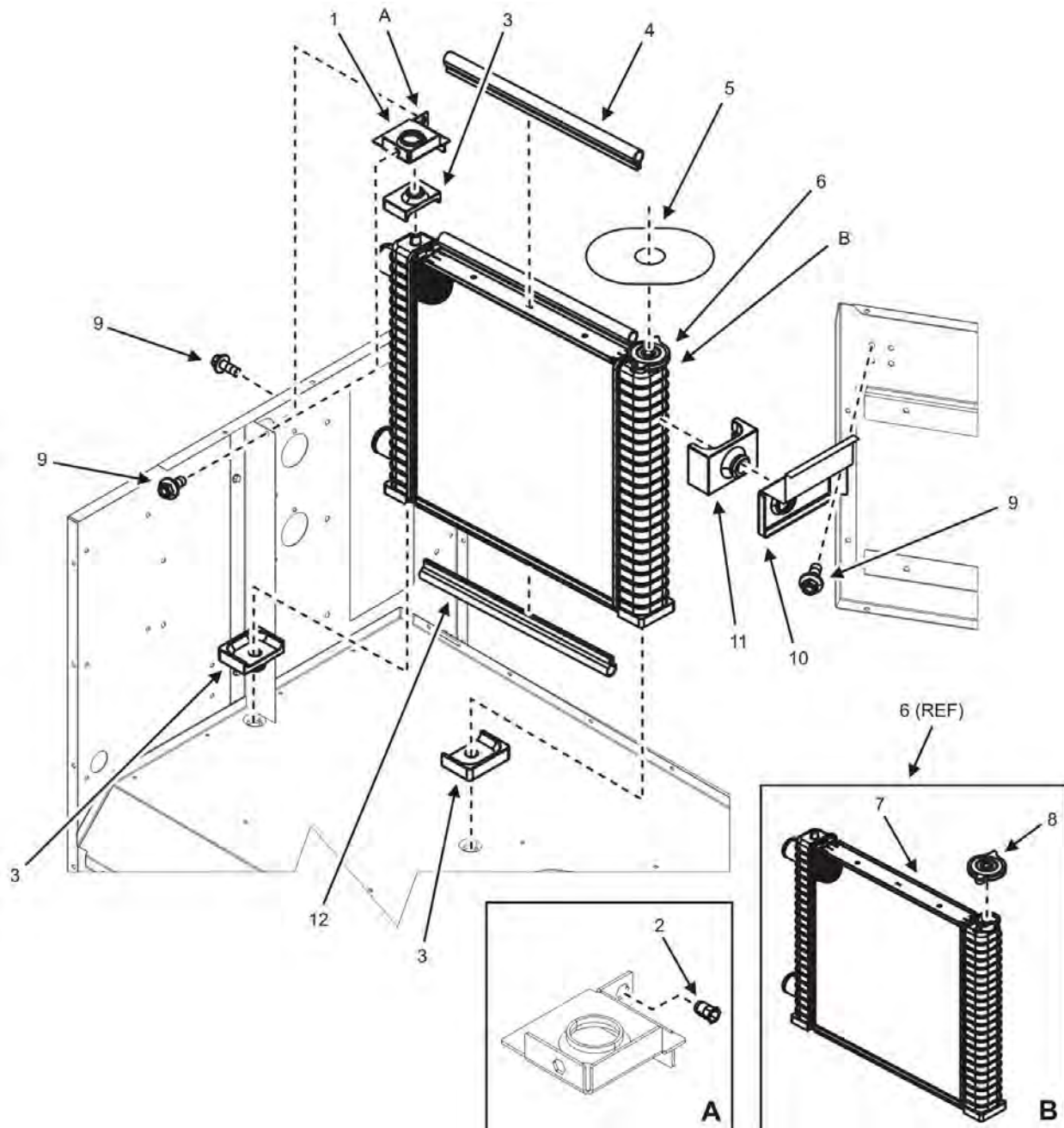


Figure 10. Cooling System Installation (Sheet 1 of 5).

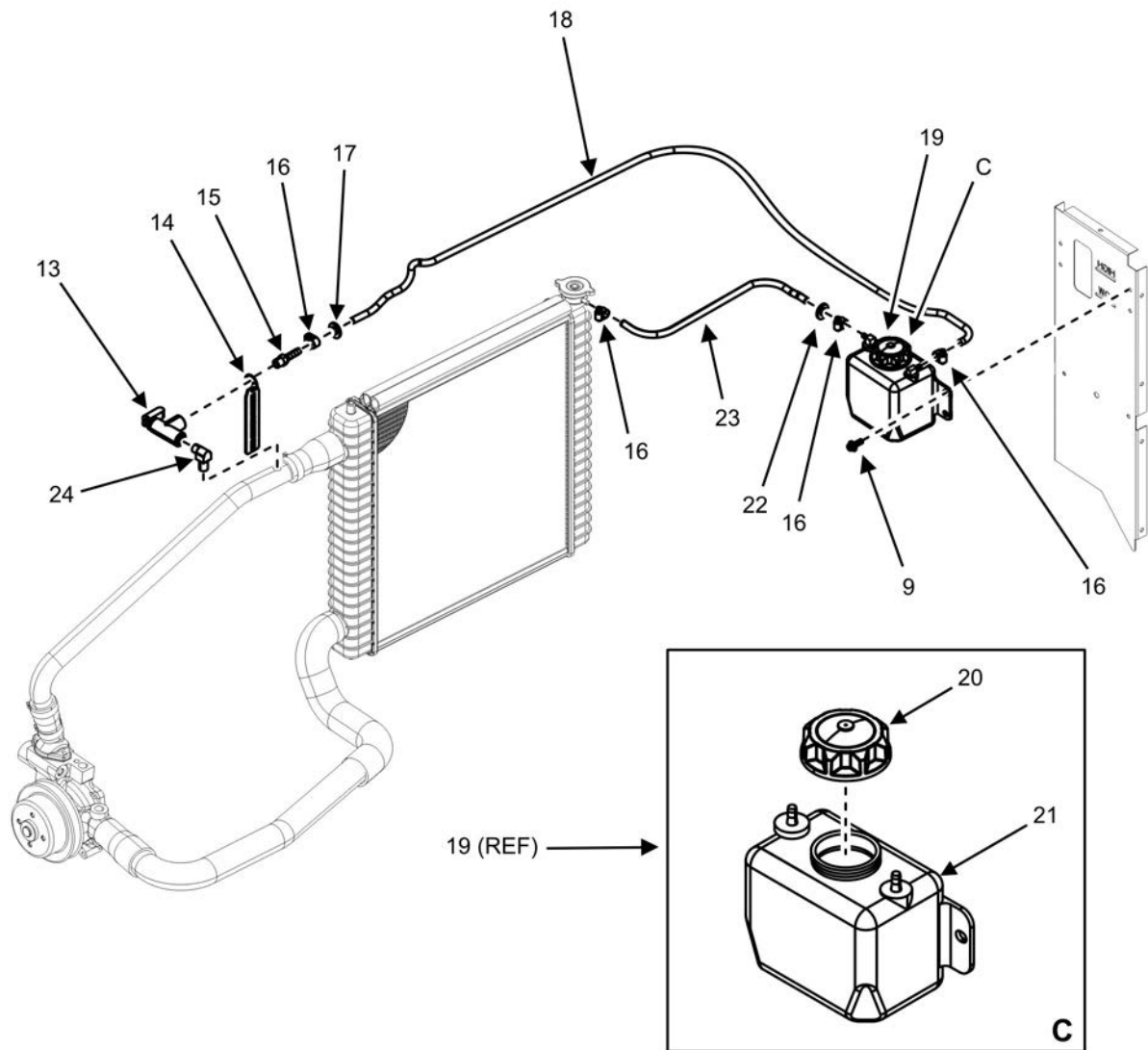


Figure 10. Cooling System Installation (Sheet 2 of 5).

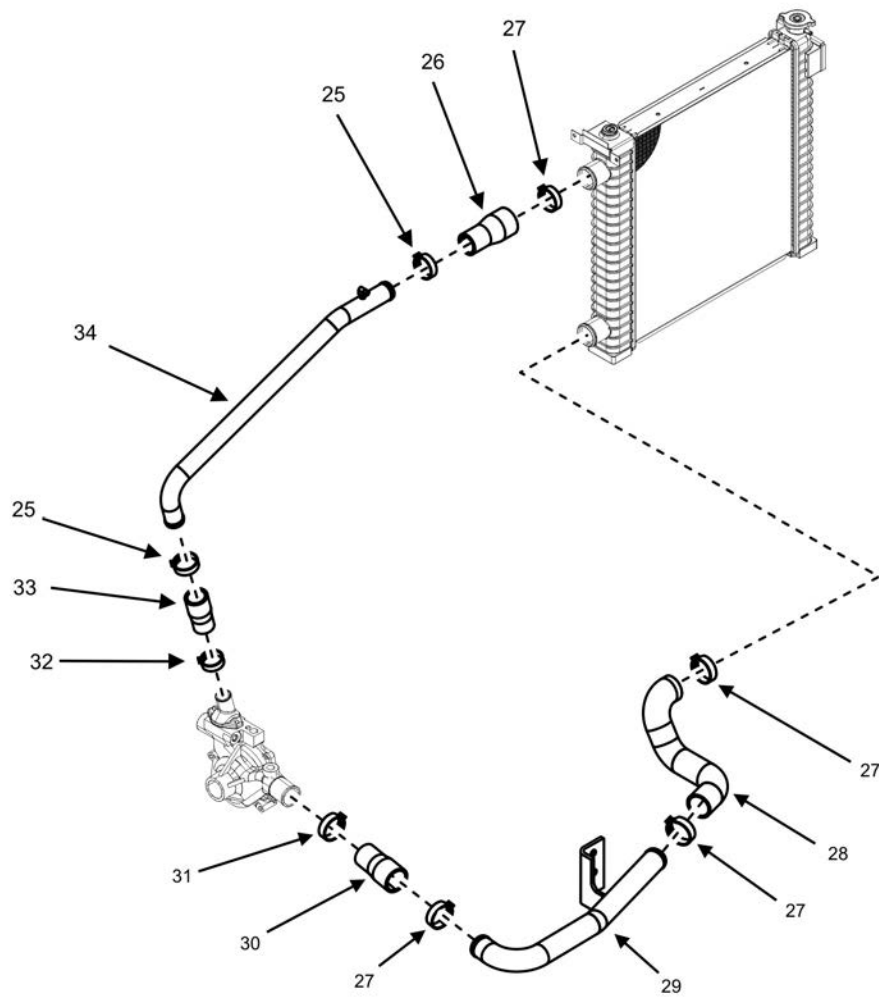


Figure 10. Cooling System Installation (Sheet 3 of 5).

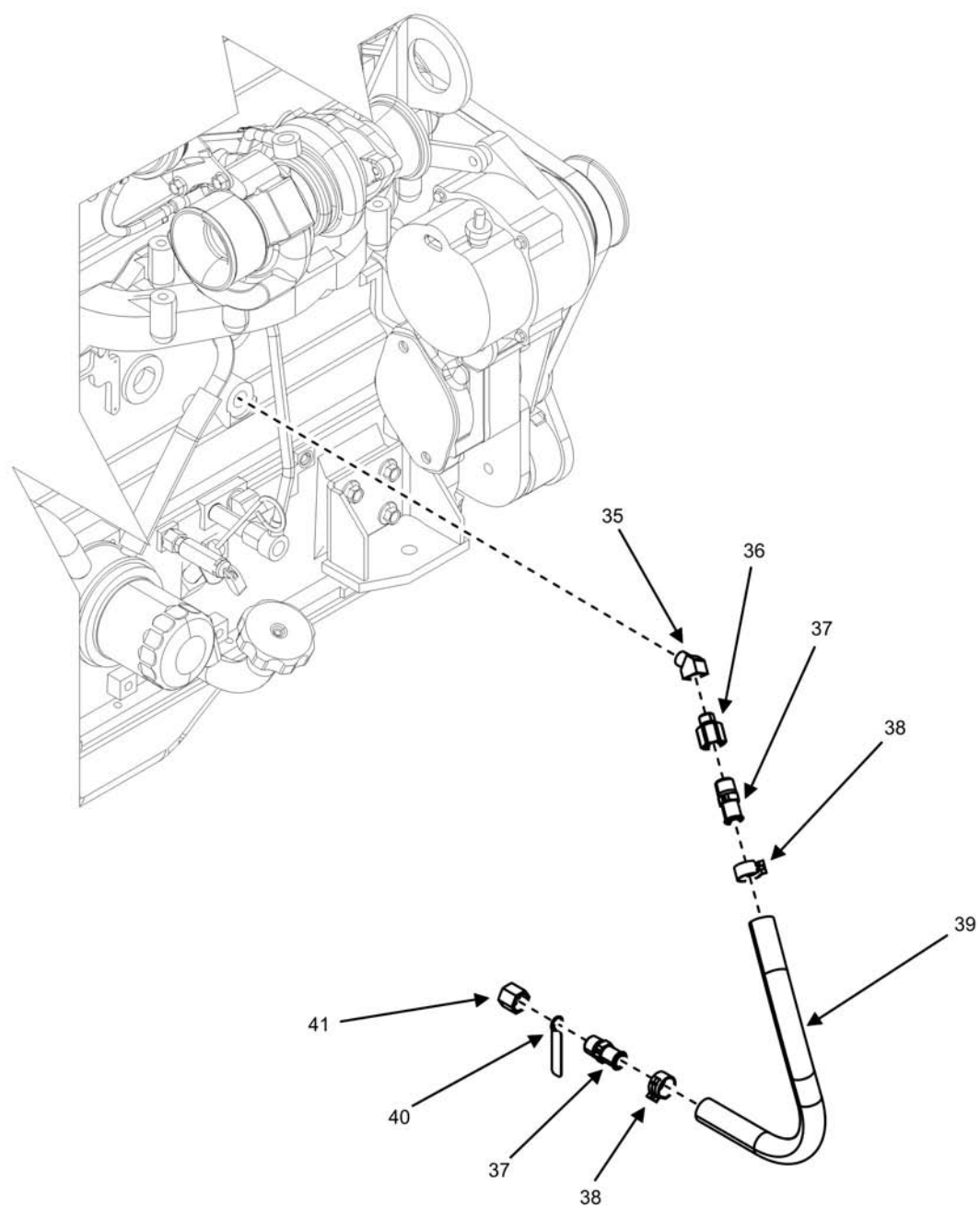


Figure 10. Cooling System Installation (Sheet 4 of 5).

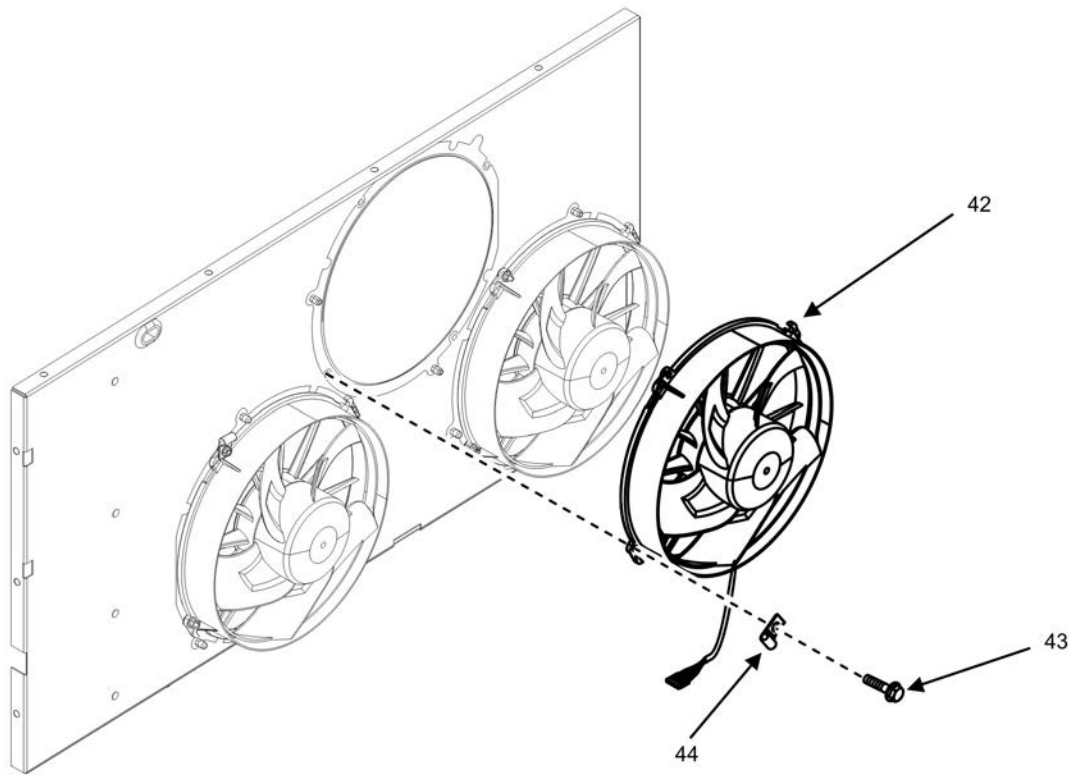


Figure 10. Cooling System Installation (Sheet 5 of 5).



(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 06	
								FIG. 10 COOLING SYSTEM INSTALLATION	
1	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21628	.BRACKET, MOUNTING	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893727	3A2G6	39101-76030	..NUT, PLAIN, CLINCH	2
3	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-20863	.MOUNT, RADIATOR	3
4	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21030-2	.SEAL, EDGE (MAKE FROM A1512 ON BULK ITEMS LIST AND CUT TO LENGTH 470 MM +/- 5)	2
5	PCFZZ	PCFZZ	PCFZZ	PCFZZ	2815015957354	44940	04-21632	.SEAL, RADIATOR	1
6	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-21168-2	.RADIATOR ASSEMBLY	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2930015961473	44940	0130-8256-2-010L	..RADIATOR	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2930015971233	44940	JSKG12	..CAP, FILLER, OPENING	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015963670	05047	AES10M06A016WB4K42	.SCREW, FLANGE HEAD M6 X 1.0 X 16	8
10	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21633	.BRACKET, RADIATOR	1
11	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-20864	.MOUNT, RADIATOR	1
12	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21031-2	.SEAL, EDGE (MAKE FROM A1512 ON BULK ITEMS LIST AND CUT TO LENGTH 470 MM +/- 5)	2
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4820013671836	70411	SP2529VT	..VALVE, CHECK	1
14	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21598	.LABEL, INFORMATION COOLANT DRAIN HOSE	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730005951078	93061	125HBL-4-2	.ADAPTER, STRAIGHT	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730008716729	61424	6202	.CLAMP, HOSE	5
17	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5325001850001	96906	MS35489-46	.GROMMET, NONMETALLIC	1
18	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21437-4	.HOSE, VENT (MAKE FROM 3058529 ON BULK ITEMS LIST AND CUT TO LENGTH AS REQUIRED)	1
19	PBFFF	PBFFF	PBFFF	PBFFF	2815015905312	0E3E3	070520BE	.TANK, COOLANT	1
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2930015882852	0E3E3	080061BE	..CAP, COOLANT	1
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2815015906391	0E3E3	062200	..TANK SECTION, FLUID	1
22	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5325002708890	96906	MS35489-22	.GROMMET, NONMETALLIC	2
23	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21437-2	.HOSE, VENT (MAKE FROM 3058529 ON BULK ITEMS LIST AND CUT TO LENGTH 450 MM +/- 10)	1

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2815015908812	44940	SAEJ5302-2130239B	.ELBOW, PIPE	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-47	.CLAMP	2
26	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-20964	.HOSE, COOLANT	1
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-61	.CLAMP	4
28	PCFZZ	PCFZZ	PCFZZ	PCFZZ	2815015908778	44940	04-20963	.HOSE, COOLANT	1
29	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20968	.TUBE, COOLANT, LOWER	1
30	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4720015957088	44940	04-20966	.HOSE, COOLANT	1
31	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-58	.CLAMP	1
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-42	.CLAMP	1
33	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-20965	.HOSE, COOLANT	1
34	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20967	.TUBE, COOLANT, UPPER	1
35	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5306-6130339B	.ELBOW, PIPE	1
36	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5308-6130139B	.ADAPTER, HOSE	1
37	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ12318-12430160B	.ADAPTER, TUBE	2
38	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-27	.CLAMP TYPE CTB	2
39	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21832-1	.HOSE, COOLANT	1
40	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21599	.LABEL, INFORMATION COOLANT DRAIN HOSE	1
41	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730014079298	93061	213P-8	.CAP, PIPE, 1/2 INCH NPTF	1
42	PAFZZ	PAFZZ	PAFZZ	PAFZZ		C0574	W3G300-ER38-47	.FAN, ENGINE, COOLING	3
43	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015921168	44940	AES10M06A025WB4K 42	.SCREW, M6 X 1 X 20	12
44	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340004256432	75272	C0V-0613	.CLAMP, LOOP	1
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
FUEL SYSTEM INSTALLATION REPAIR PARTS LIST

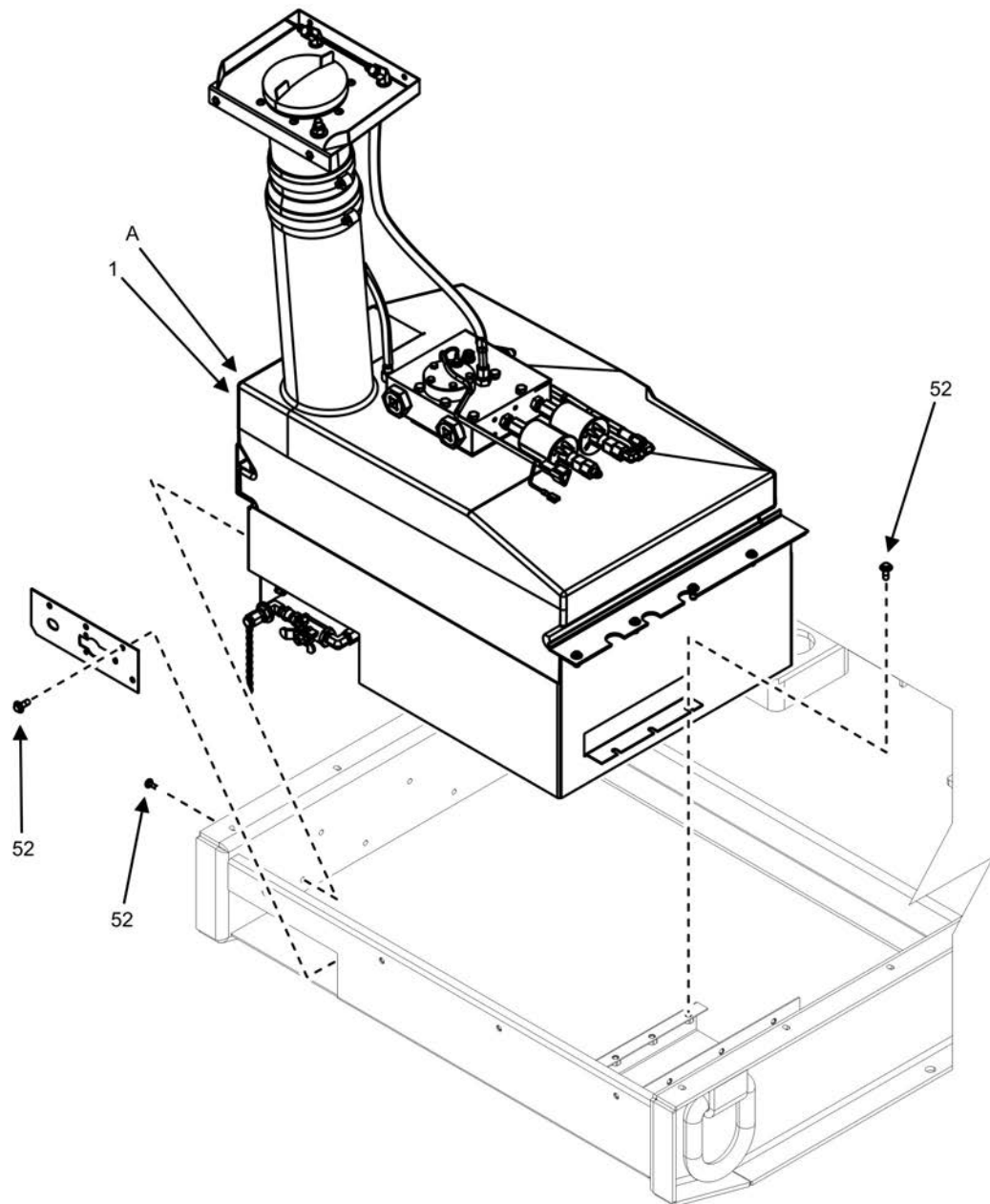


Figure 11. Fuel System Installation (Sheet 1 of 6).

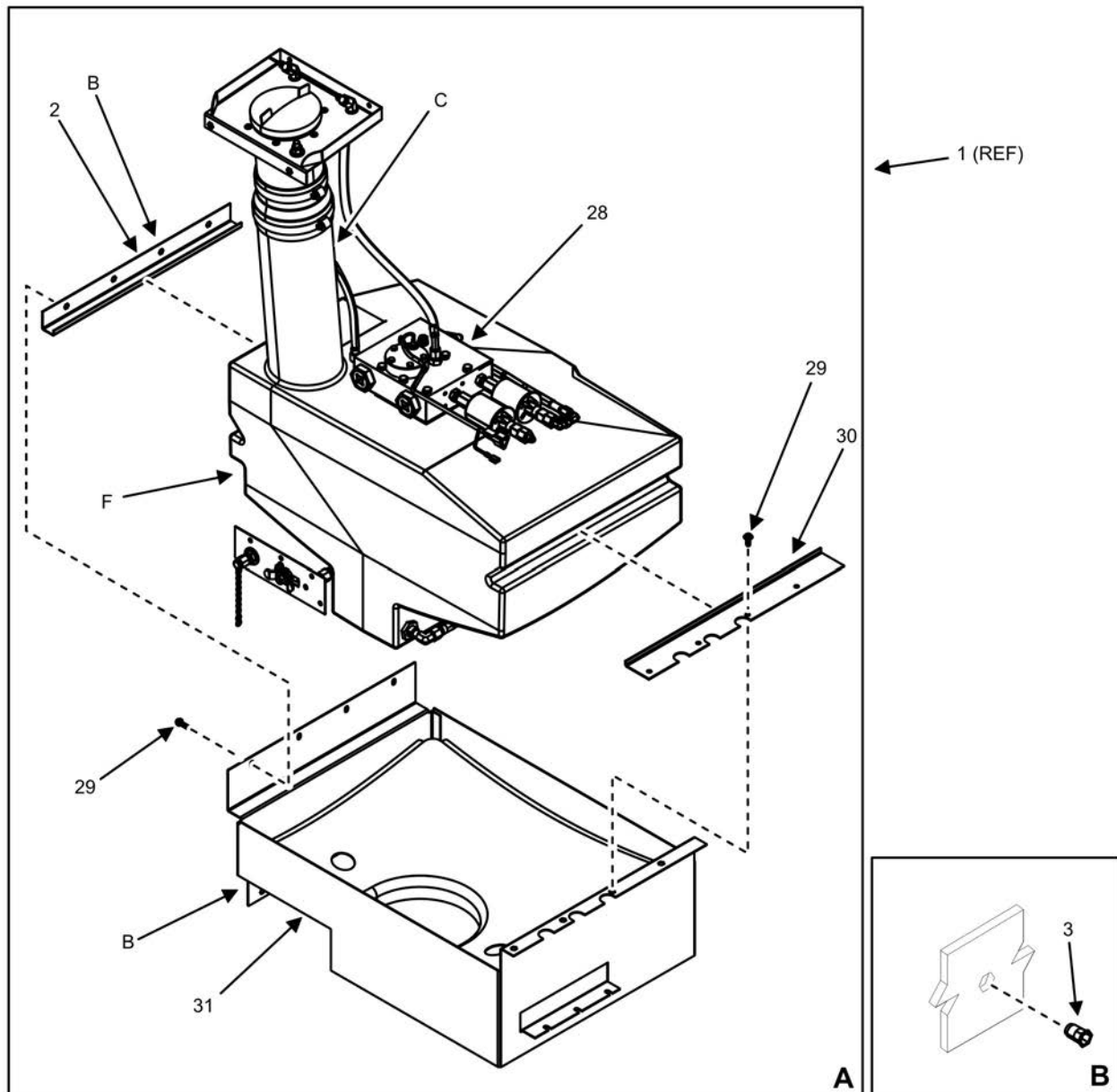


Figure 11. Fuel System Installation (Sheet 2 of 6).

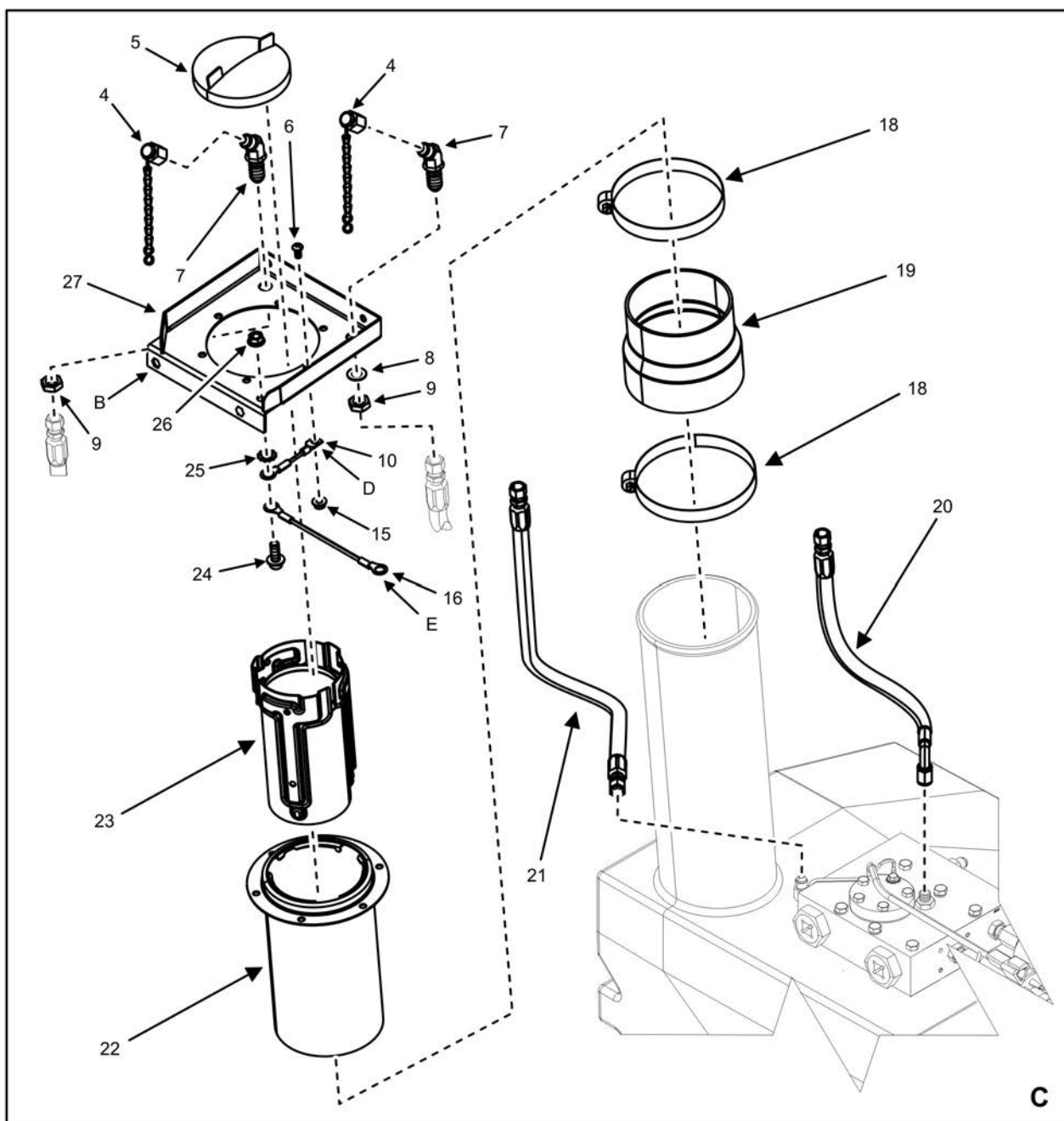


Figure 11. Fuel System Installation (Sheet 3 of 6).

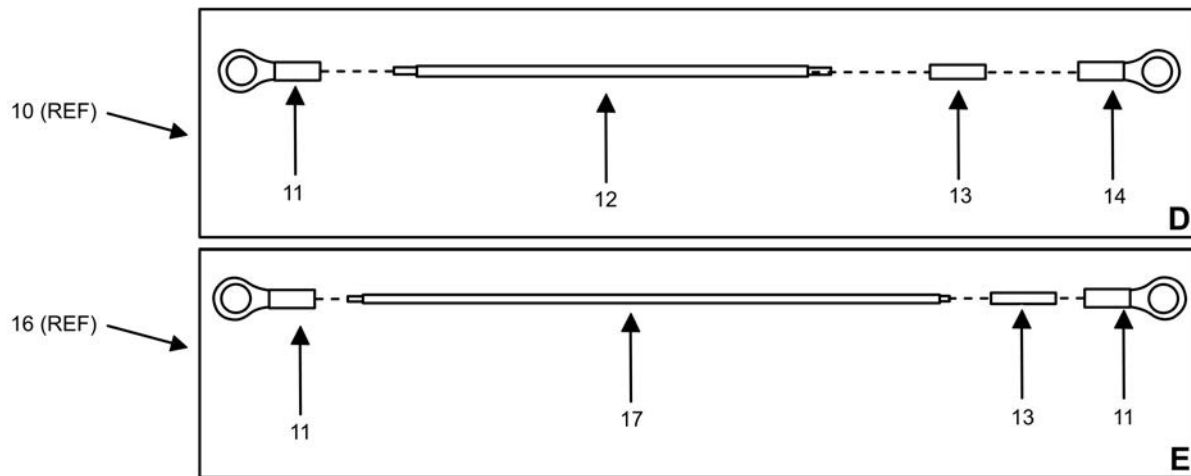
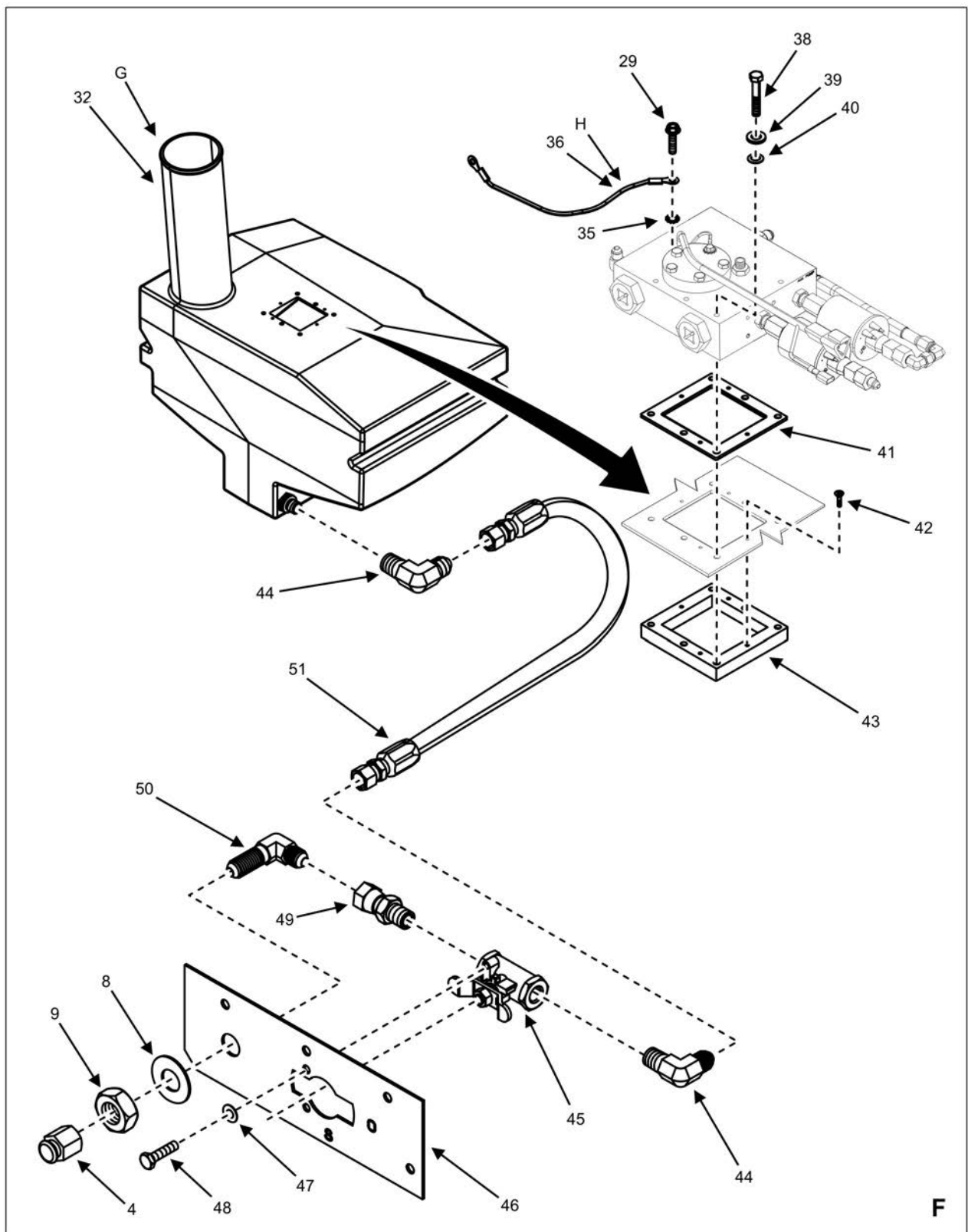


Figure 11. Fuel System Installation (Sheet 4 of 6).



**Figure 11. Fuel System Installation (Sheet 5 of 6).**

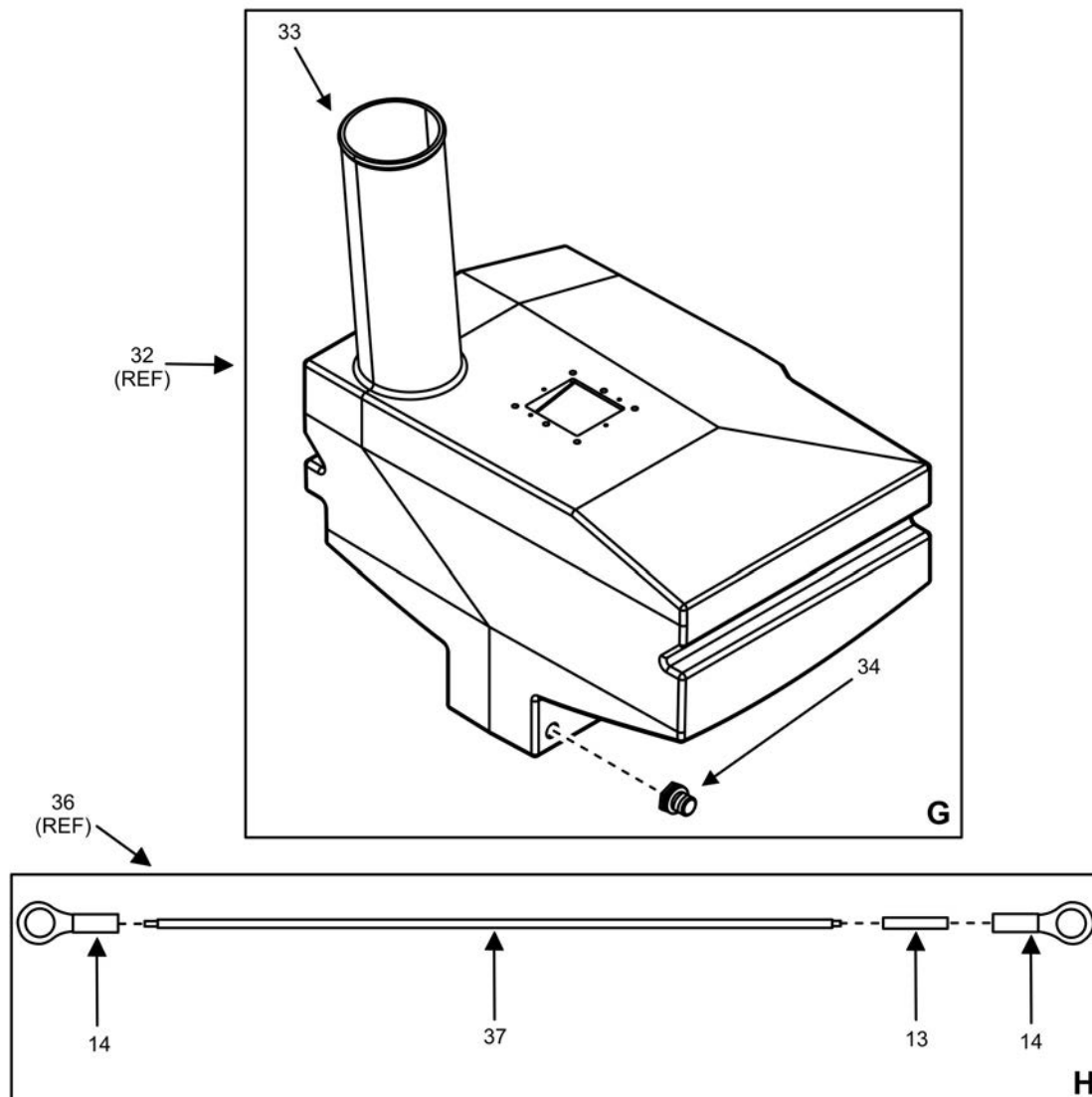


Figure 11. Fuel System Installation (Sheet 6 of 6).



(1)	(2)				(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
									GROUP 07	
									FIG. 11 FUEL SYSTEM INSTALLATION	
1	XCFFF	XCFFF	XCFFF	XCFFF		44940	04-20380		..FUEL SYSTEM ASSEMBLY 30KW	1
2	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20866		..BRACKET	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893727	3A2G6	39101-76030		...NUT, PLAIN, CLINCH	15
4	PAFFF	PAFFF	PAFFF	PAFFF	4730015979059	44940	04-21043		..CAP, TUBE	3
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5342015433212	30554	88-20016		..CAP, FILLER OPENING	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN7380A2-M6X12		..SCREW, CAP, SOCKET HEAD	6
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5145070801B		..ELBOW, FLANGE TO PIPE	2
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015894140	3A054	95395A250		..WASHER, FLAT 1/2 INCH	3
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5145070118C		..NUT, HEX JAM 1/2-20 INCH	3
10	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21153-1		..LEAD, ELECTRICAL	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		00779	130207		...TERMINAL, RING	1
12	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-12-65		...STRAND, WIRE (MAKE FROM 3271-12-65 ON BULK ITEMS LIST CUT TO LENGTH 150 MM +/- 25)	1
13	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG2T5-100B		...LAMINATE, LABEL COVER	3
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001139828	96906	MS25036-148		...TERMINAL, RING	3
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6		..NUT, PLAIN, EXTENDED	6
16	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21153-5		..LEAD, ELECTRICAL	1
17	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-12-65		...STRAND, WIRE (MAKE FROM 3271-12-65 ON BULK ITEMS LIST CUT TO LENGTH 1400 MM +/- 25)	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508F72		..CLAMP	2
19	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4730015893753	44940	04-21352		..COUPLING, HOSE	1
20	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-21439-5		..LINE, FUEL	1
21	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-21439-11		..LINE, FUEL	1
22	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20202		..MODULE, FUEL FILLER	1
23	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20203		..TUBE, FUEL FILL	1
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES01C025Z7A32		..BOLT, HEX HEAD M10 X 1.5 X 25	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW20M10C000DB8A 31		..WASHER, LOCK M10	1
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEN18M10C000DG8A31		..NUT, HEX FLANGE HEAD (M10 X 1.5)	1

(1)		(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
27	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20838		..BRACKET	1
28	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20617		..MODULE, FUEL SYSTEM (SEE FIGURE 12 FOR PARTS BREAKDOWN)	1
29	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A016WB4K42		..SCREW, HEX FLANGE HEAD M6 X 1 X 16	8
30	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20867		..BRACKET	1
31	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20644		..TANK SUPPORT	1
32	PAFFF	PAFFF	PAFFF	PAFFF	2815015908774	44940	04-20357		..TANK	1
33	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20502		..TANK, FUEL	1
34	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015890851	1DS87	P35900661		..CONNECTOR, HOSE, BULKHEAD	1
35	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW13X250000GD5A21		..WASHER, LOCK 1/4 EXT TOOTH	1
36	XBFFF	XBFFF	XBFFF	XBFFF			04-21153-14		..LEAD, ELECTRICAL	1
37	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-12-65		..STRAND, WIRE (MAKE FROM 3271-12-65 ON BULK ITEMS LIST CUT TO LENGTH 400MM +/- 25)	1
38	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES07M06A070WB4AA1		..SCREW, HHC M6 X 1 X 70	6
39	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW25X266062EA1AF1		..WASHER, FLAT 1/4	6
40	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015960059	4JMM9	RS62200		..WASHER, SEALING	6
41	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5330015971377	44940	04-20536		..GASKET	1
42	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES47M4D7016DG6CP2		..SCREW, FLAT	2
43	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20535		..RETAINER, GASKET	1
44	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5145-4070202 C		..FITTING, TUBE ELBOW 1/2 INCH TO 1/4 NPT	2
45	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4820015891015	93061	XV502P-4-04		..VALVE, BALL	1
46	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21387		..BRACKET, VALVE	1
47	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN126-M5		..WASHER, FLAT M5	4
48	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015919045	44940	AESZAC190375WA1FY1		..SCREW-HHM (10-24 UNC X 3/8)	2
49	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015914508	98441	5-4 F6X-S		..ADAPTER, COUPLING 1/4 NPTF TO 1/2 INCH	1
50	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015894365	93061	5 WETX-B		..CONNECTOR, BULKHEAD 1/2-20 INCH MALE	1
51	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-21439-8		..LINE, FUEL	1
52	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015921166	44940	AES10M06A020WB4K42		..SCREW, FLANGE HEAD M6 X 1 X 20	12
END OF FIGURE										

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**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
FUEL MANIFOLD ASSEMBLY REPAIR PARTS LIST**

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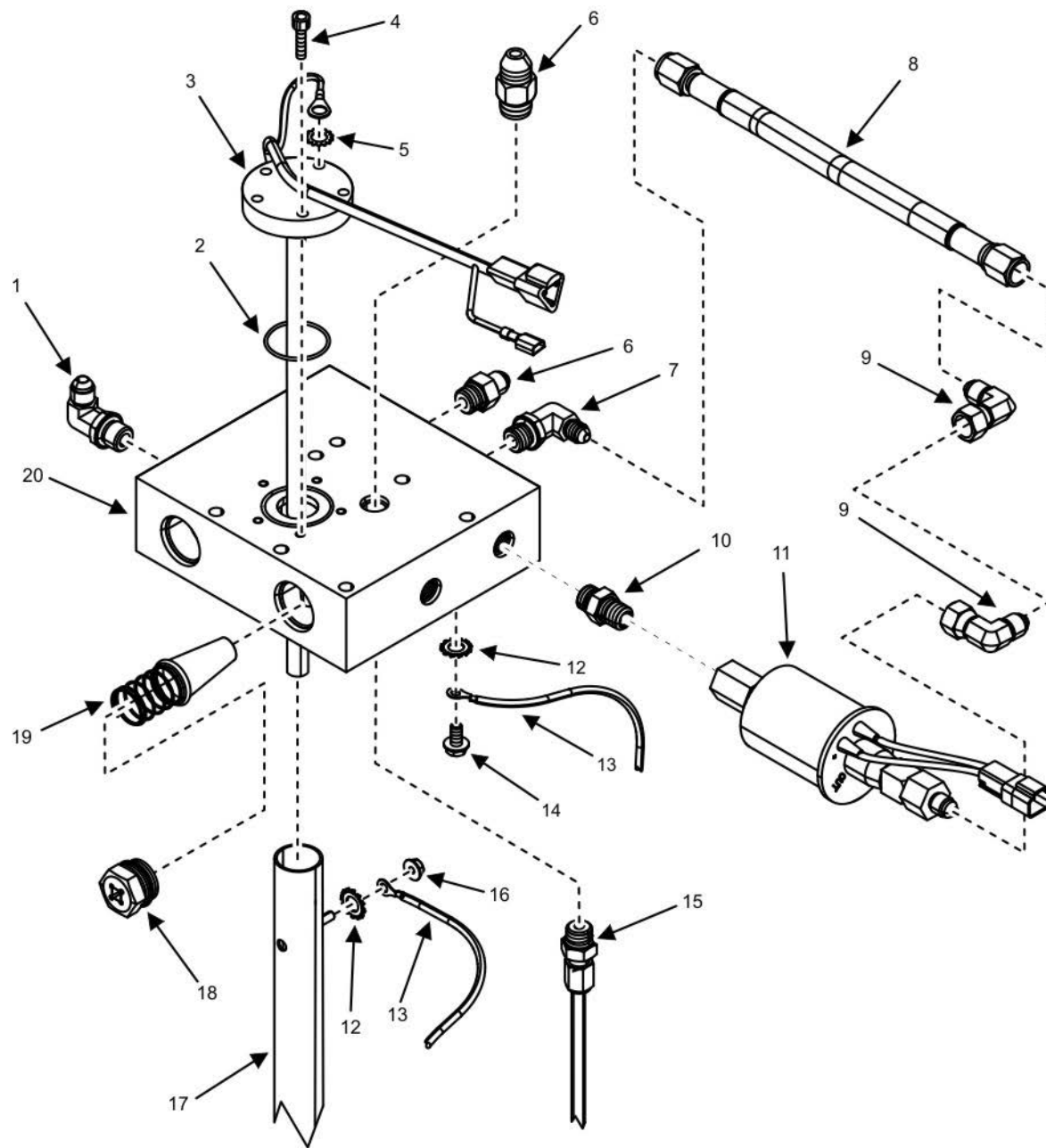


Figure 12. Fuel Manifold Assembly.

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0701	
								FIG. 12 FUEL MANIFOLD ASSEMBLY	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5145-6070220C	.FITTING, TUBE ELBOW	2
2	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	J515CH29X0386H	.SEAL, O-RING	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		55752	FSCMN-01	.SENSOR, FUEL LEVEL	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN931-M5X30	.SCREW, HEX HEAD M5 X 0.8 X 30	5
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW22X190000EA1AA1	.WASHER, LOCK EIT #10	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730012089235	81343	SAE J514 5-6 070120C	.FITTING, CONNECTOR	2
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5144-6070220C	.FITTING, TUBE ELBOW	1
8	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4720015966552	44940	04-20053	.LINE, FUEL	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5975015906706	44940	SAEJ5144070221C	.FITTING, ELBOW	2
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730008330508	44940	SAEJ5146-4080102C	.FITTING, CONNECTOR	2
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4320015870865	71425	0149-2769	.PUMP, FUEL, ELECTRIC	2
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW13X250000GD5A21	.WASHER, LOCK 1/4 EXT TOOTH	2
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999015883447	44940	04-21318-2	.LEAD, ELECTRICAL GROUND	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015963670	44940	AES07M06A016M4A21	.SCREW, HEX FLANGE HEAD M6 X 1 X 16	1
15	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20622	.TUBE, FUEL	2
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	.NUT, HEX FLANGE M6X1	1
17	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20613	.PIPE, FUEL	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5365015971376	44940	04-20406	.PLUG, THREADED	2
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015966452	44940	04-20618	.STRAINER, FUEL	2
20	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21450	.MANIFOLD, FUEL	1
								END OF FIGURE	



FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
FUEL FILTER/WATER SEPARATOR INSTALLATION REPAIR PARTS LIST

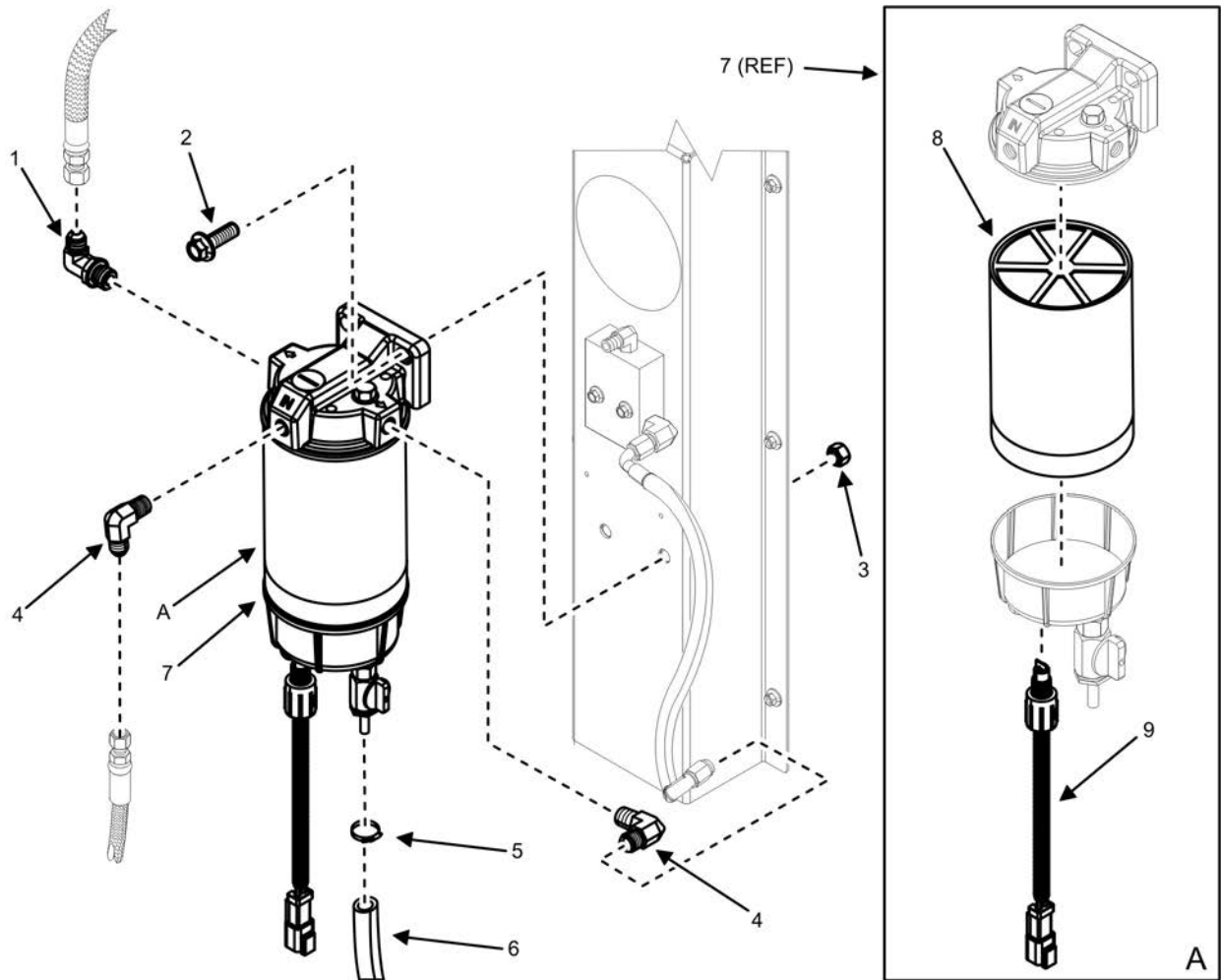


Figure 13. Fuel Filter/Water Separator Installation (Sheet 1 of 4).





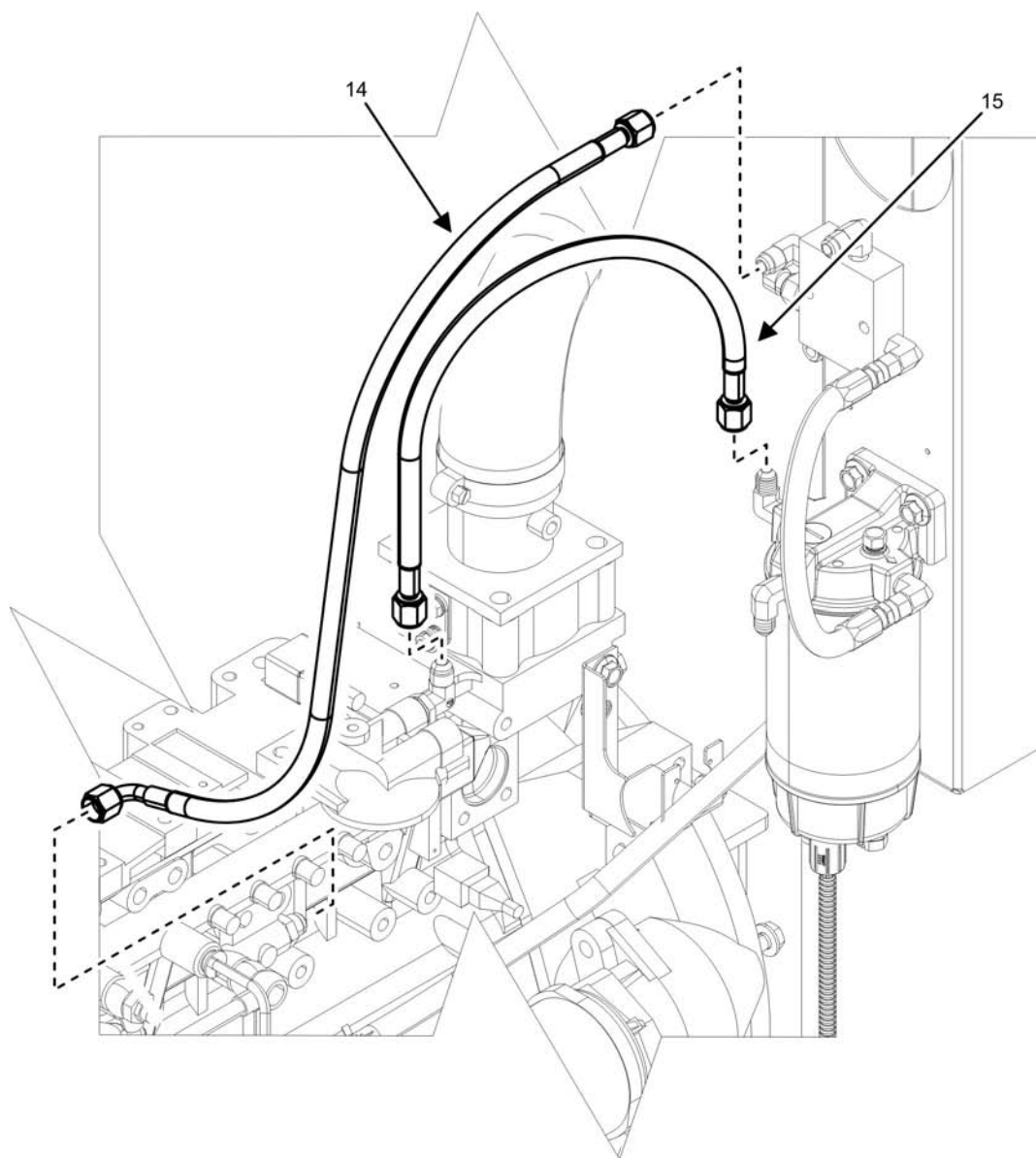


Figure 13. Fuel Filter/Water Separator Installation (Sheet 3 of 4).

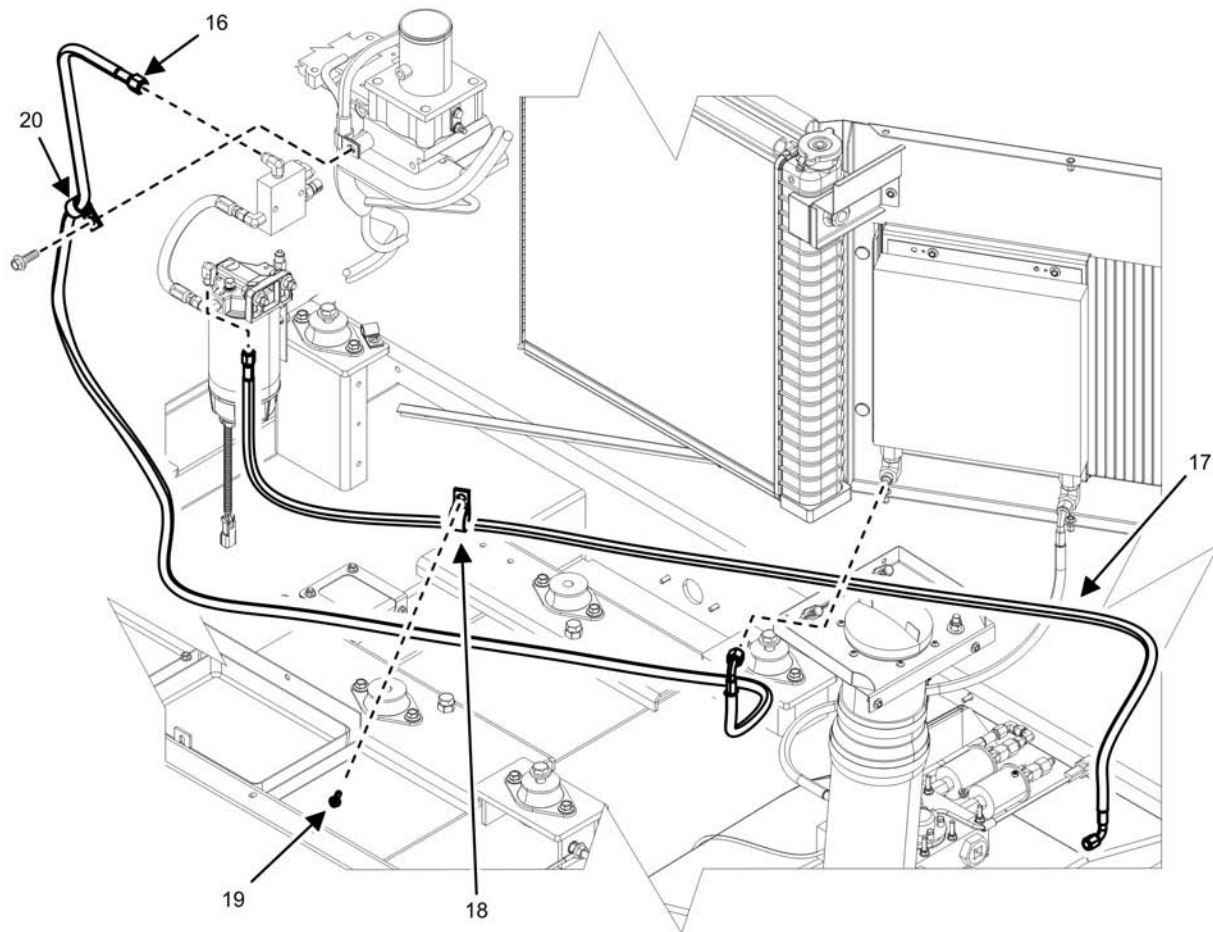
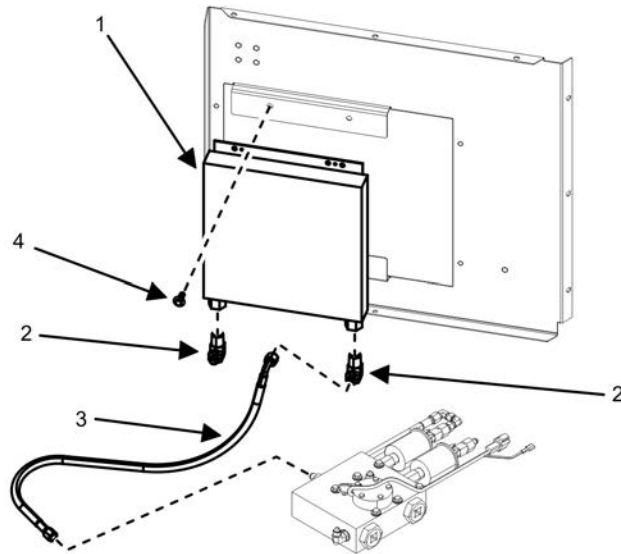


Figure 13. Fuel Filter/Water Separator Installation (Sheet 4 of 4).

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 0702	
								FIG. 13 FUEL FILTER/WATER SEPARATOR INSTALLATION	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5146070202C	.ELBOW, ADAPTER	3
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M10C030WB4K 42	.SCREW, M10 X 1.5 X 30	2
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M10	.NUT, PLAIN M10 X 1.5	2
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5145-4070202 C	.FITTING, TUBE ELBOW	3
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015917746	44940	SAEJ1508CTB-15	.CLAMP	1
6	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21485	.HOSE, FUEL (MAKE FROM 42190109 ON BULK ITEMS LIST AND CUT TO 500 MM +/- 5)	1
7	PAFFF	PAFFF	PAFFF	PAFFF		55752	245M-ONAN-01	.SEPARATOR, FUEL WATER	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2910015956561	55752	R25T	.FILTER, FUEL	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2990015914741	55752	RK55617	.SENSOR, WATER	1
10	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-21439-17	.LINE, FUEL	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5144140109C	.PLUG, PIPE	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06AD40WB4K42	.SCREW, CAP, HEXAGON M6 X 1 X 35	2
13	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20885	.MANIFOLD, FUEL	1
14	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	04-21439-4	.LINE, FUEL	1
15	PCFZZ	PCFZZ	PCFZZ	PCFZZ	2815015915173	44940	04-21439-14	.LINE, FUEL	1
16	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4710015957532	44940	04-21439-15	.LINE, FUEL	1
17	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4720015957305	44940	04-21439-12	.LINE, FUEL	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340004044098	75272	COV-1713	.CLAMP, LOOP	4
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015921168	44940	AES10M06A020WB4K42	.SCREW, M6 X 1 X 20	4
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340004044098	75272	COV-1313	.CLAMP, LOOP	1
								END OF FIGURE	



**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**FUEL COOLER INSTALLATION REPAIR PARTS LIST**



**Figure 14. Fuel Cooler Installation.**

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 0703									
FIG 14. FUEL COOLER INSTALLATION									
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		7Y635	0C-H7B	.COOLER, FUEL	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ5146-8070202 C	.FITTING	2
3	PCFZZ	PCFZZ	PCFZZ	PCFZZ	2815015908815	44940	04-21439-16	.LINE, FUEL	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015963670	05047	AES10M06A016WB4K42	.SCREW, M6 X 1 X 16	4
END OF FIGURE									



FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
OUTPUT BOX INSTALLATION REPAIR PARTS LIST

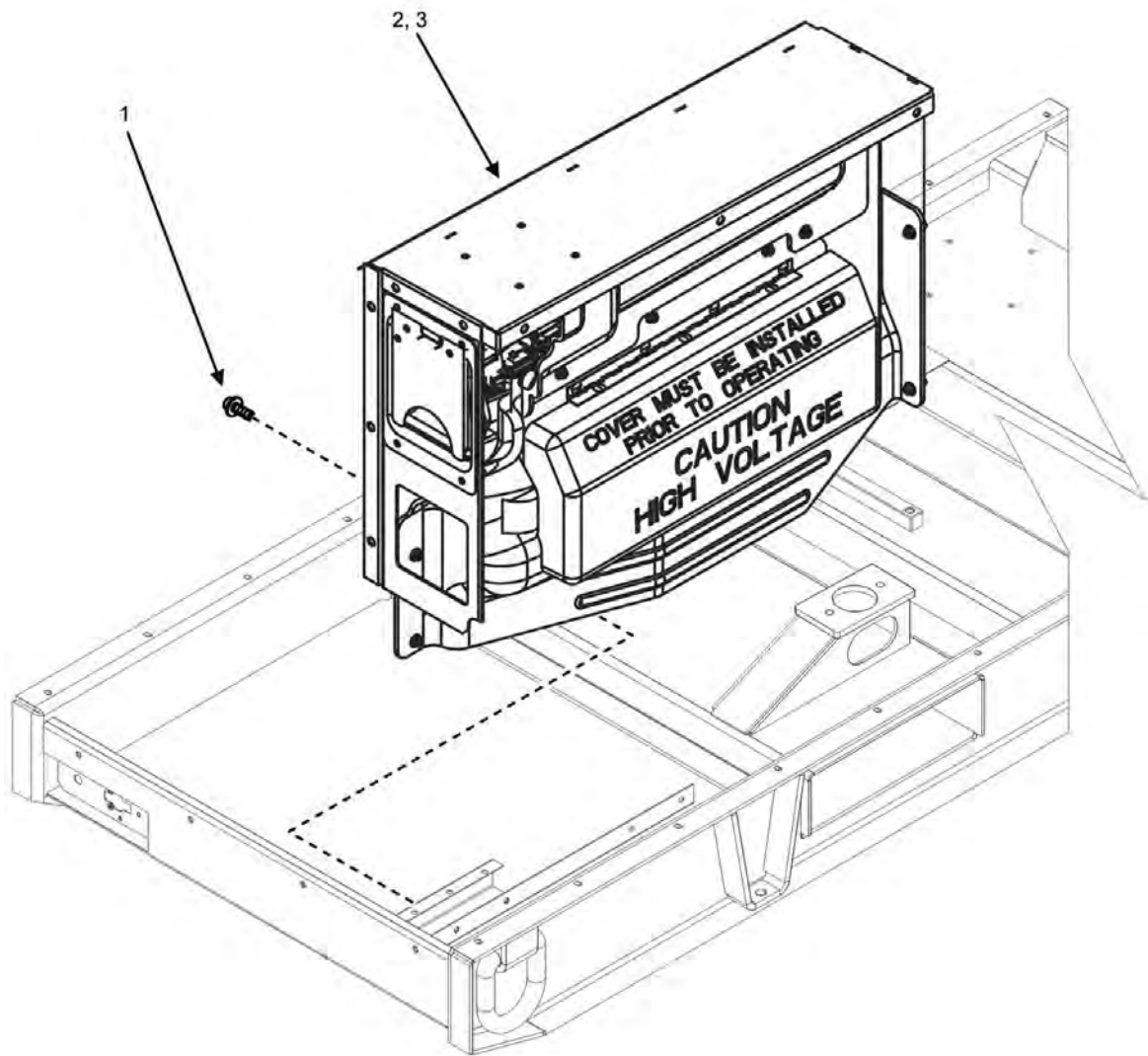
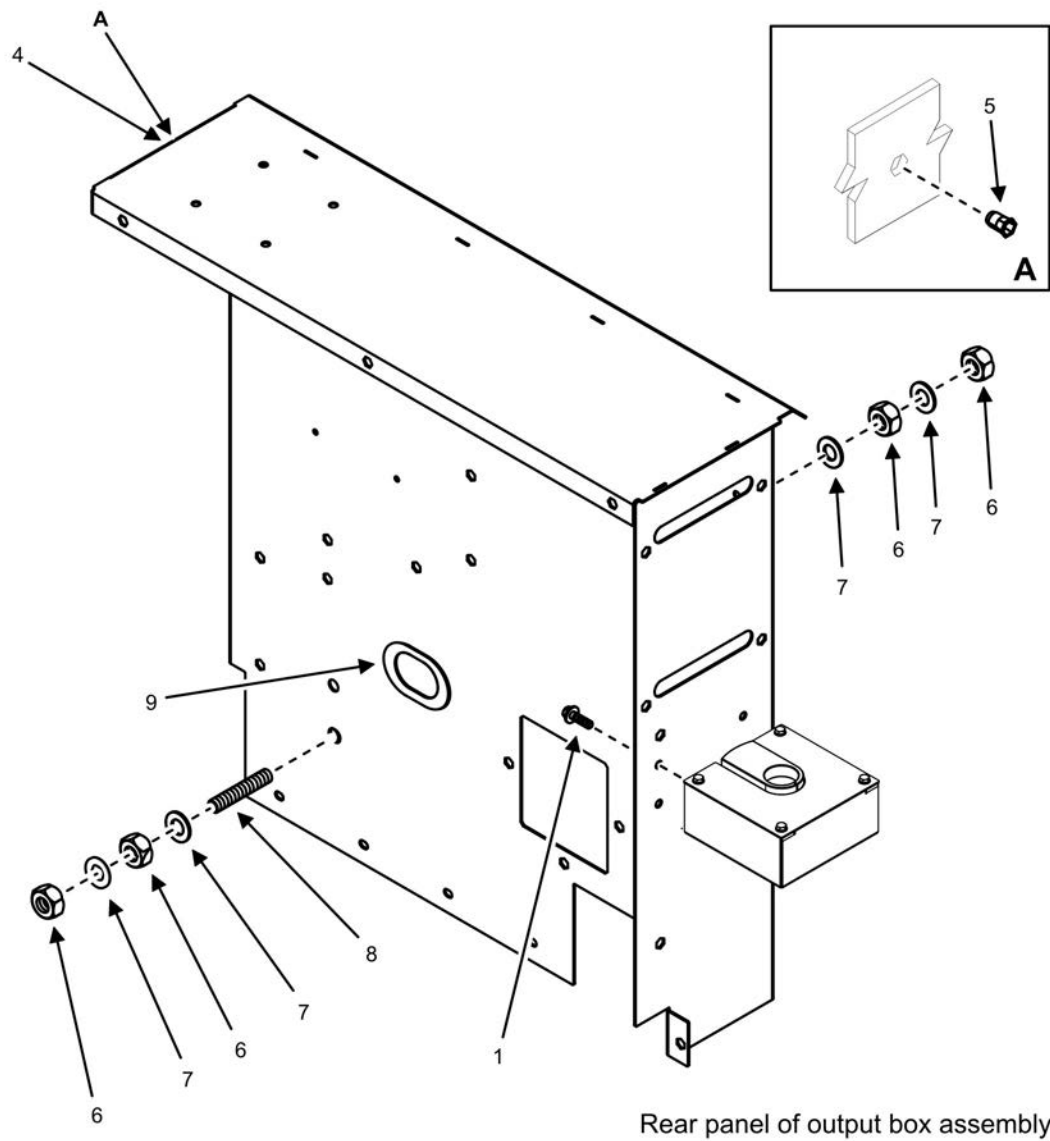


Figure 15. Output Box Installation (Sheet 1 of 2).



Rear panel of output box assembly

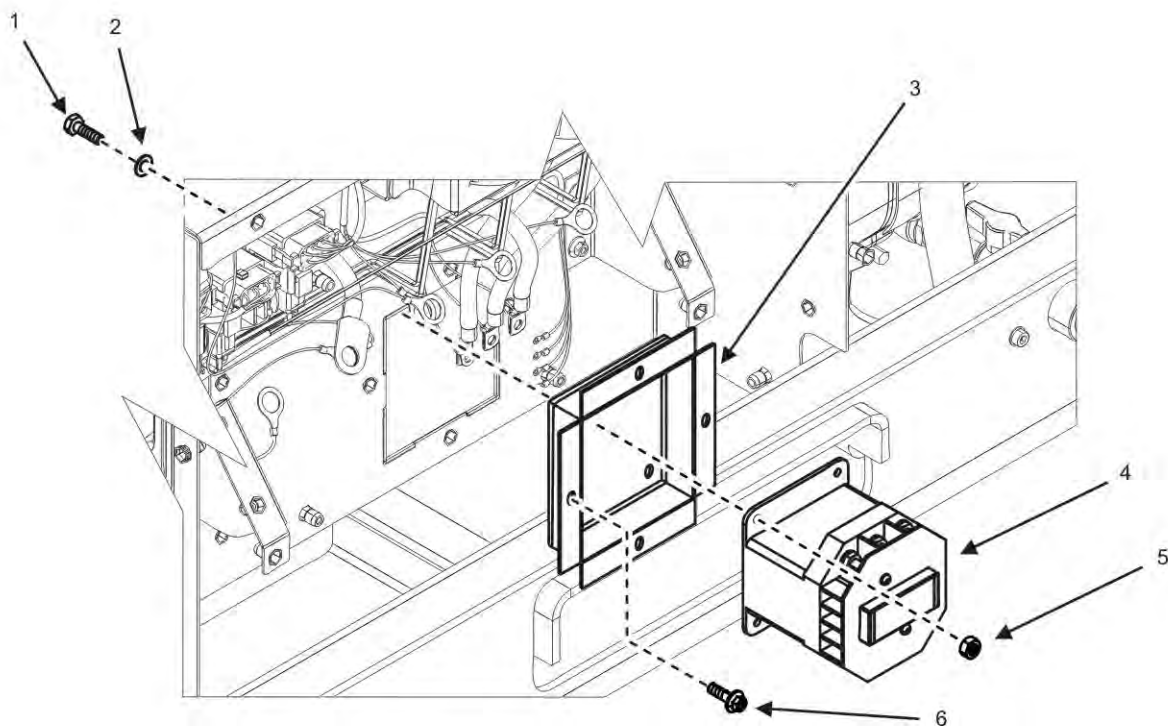
Figure 15. Output Box Installation (Sheet 2 of 2).



(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 08	
								FIG. 15 OUTPUT BOX INSTALLATION	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015967033	OKMA3	AES10M06A020WB4K42	.SCREW	12
2	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20456-1	.OUTPUT BOX ASSEMBLY (SEE FIGURES 16 – 22 FOR PARTS BREAKDOWN) UOC: 98L	1
3	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20456-2	.OUTPUT BOX ASSEMBLY (SEE FIGURES 16 – 22 FOR PARTS BREAKDOWN) UOC: 98M	1
4	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20634	..PANEL, OUTPUT BOX	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893727	3A2G6	39101-76030	...NUT, PLAIN, CLINCH	36
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015963627	05047	AEN15M10C000WA2A A1	..NUT, HEX (M10X1.5)	4
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015963750	05047	AEW20X010000BD8A 21	..WASHER, LOCK M10 EXTERNAL STAR	4
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5307015884044	44940	04-21292	..STUD, PLAIN (M10X1.5X55)	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20902-4	..EDGING, OUTPUT BOX (MAKE FROM A3521 BULK ITEMS LIST CUT TO LENGTH 197 MM)	1
								END OF FIGURE	



**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**CONTACTOR REPAIR PARTS LIST**



**Figure 16. Contactor (Sheet 1 of 3).**

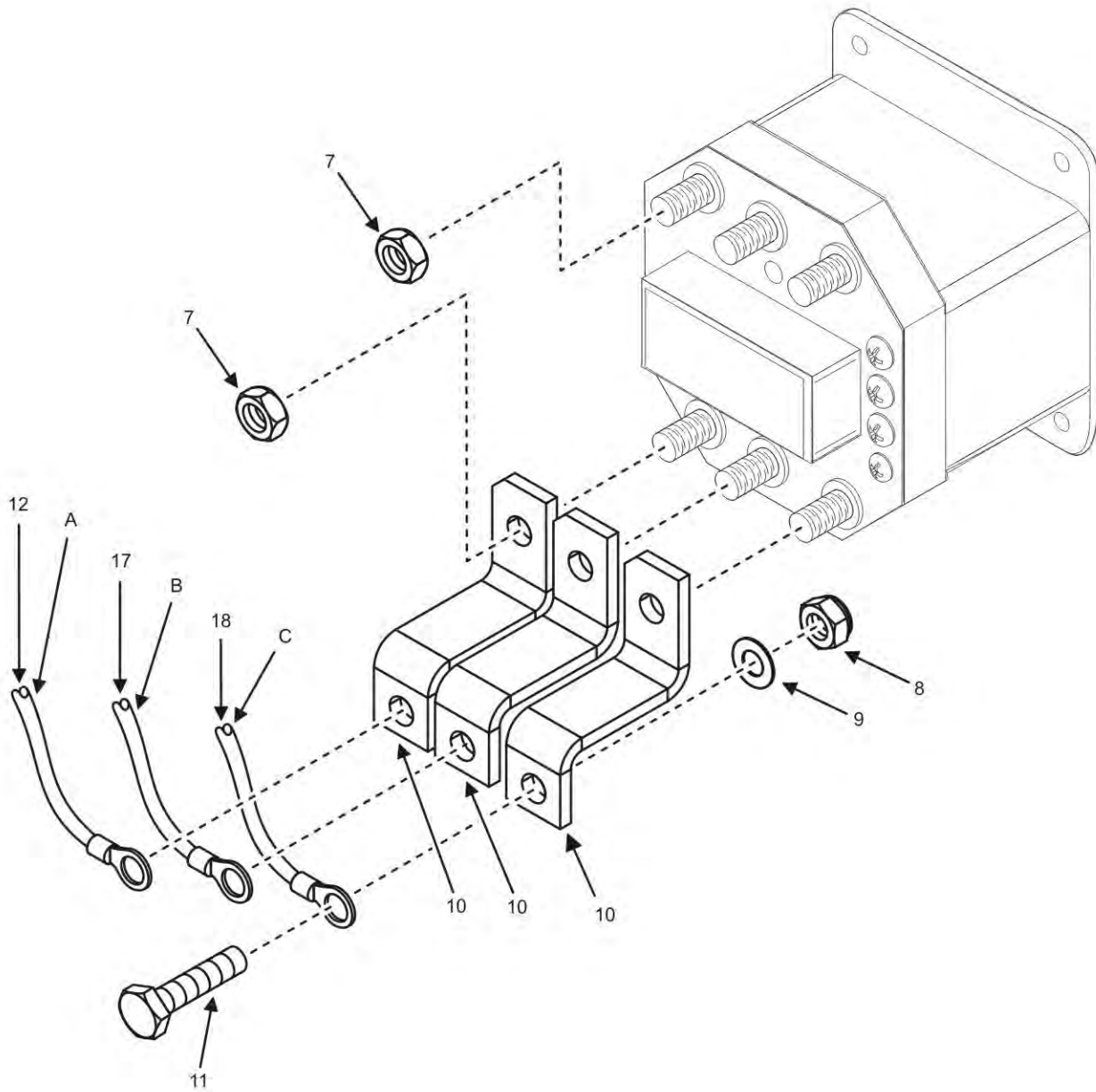


Figure 16. Contactor (Sheet 2 of 3).

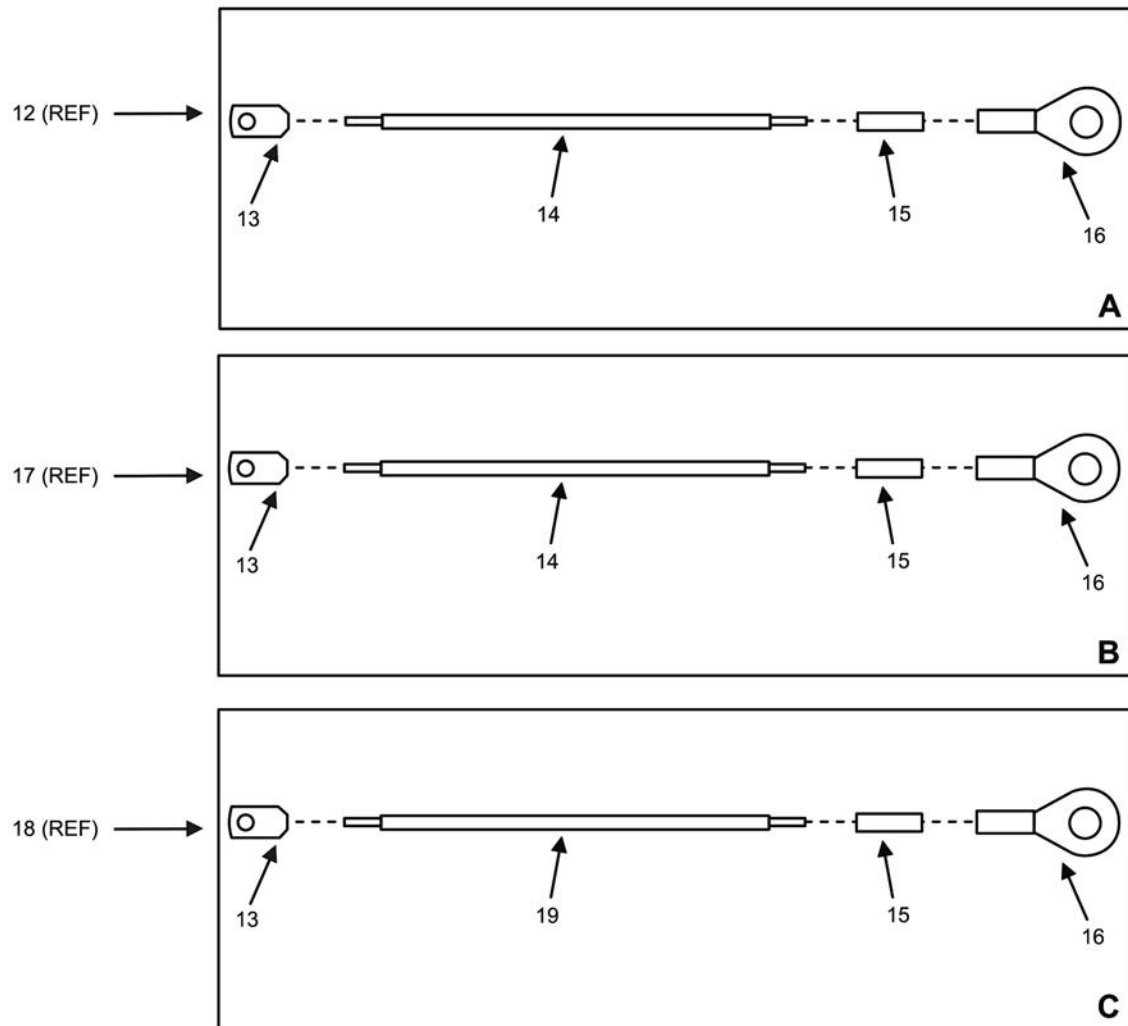
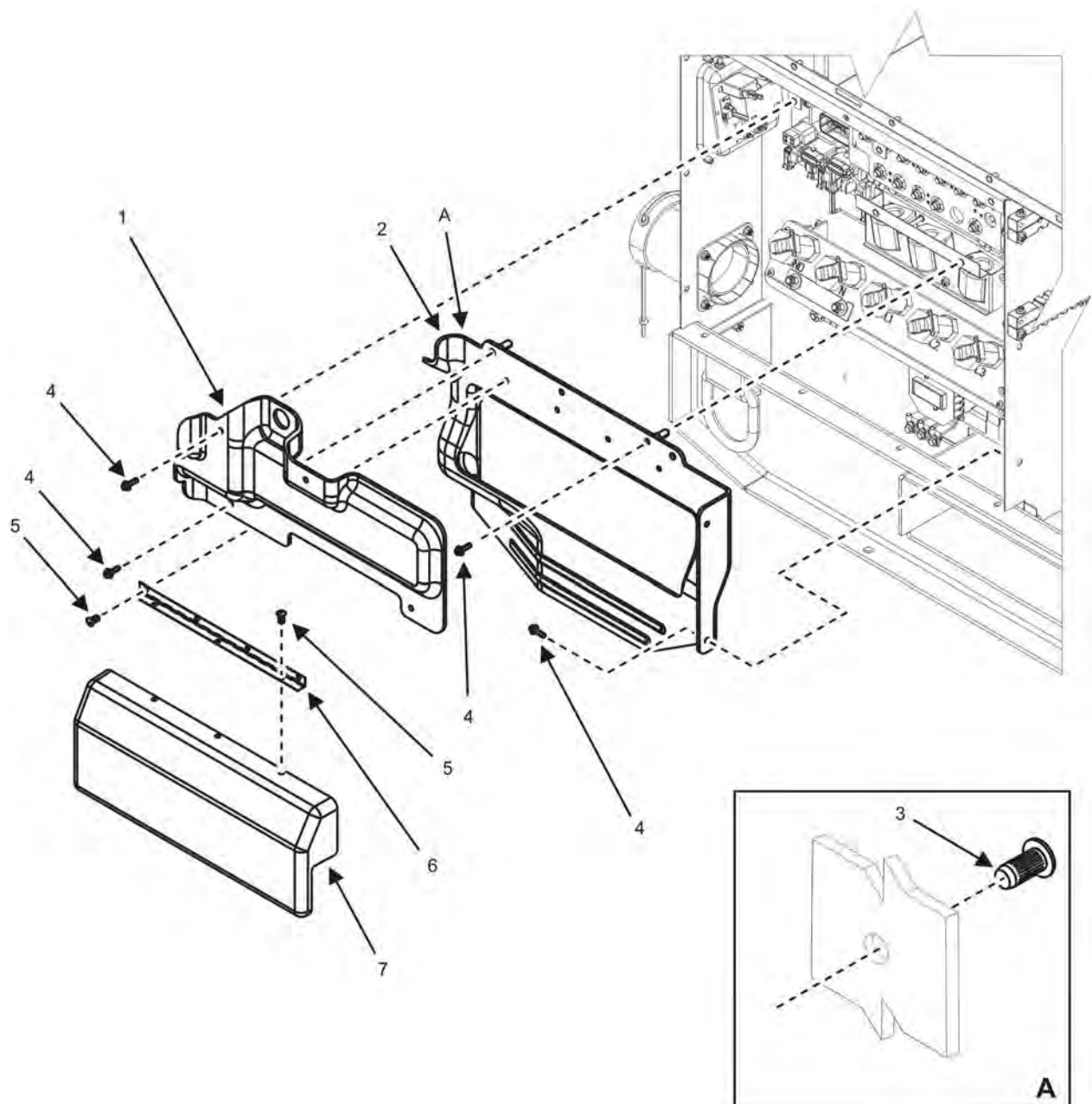


Figure 16. Contactor (Sheet 3 of 3).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0801	
								FIG. 16 CONTACTOR	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN931-M4X16	.SCREW, HEX HEAD	4
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014849183	1KWT0	085295	.WASHER, FLAT M4	4
3	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21377	.PANEL OUTPUT BOX	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6110015915195	01XD4	CT150E24E2S	.CONTACTOR, ELECTRICAL	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M4	.NUT, HEX FLANGE M4 X 0.	4
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015921168	05047	AES10M06A020WB4K42	.SCREW, HEX HEAD FLANGE M6 X 1 X 20	4
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015963624	05047	AEN12F250000CH2A 31	.NUT, HEX 1/4- 28 6	6
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015954930	1MMD1	M6CNNEBR/985	.NUT, LOCK, M6 BRASS	3
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015963771	05047	AEW25X266031UB5A 11	.WASHER, FLAT	6
10	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21357	.BUSBAR, LOAD CONTACTOR	3
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015919049	44940	AES07M06A018UB5A 11	.SCREW, HEX HEAD M6 X 16	3
12	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20275	.LEAD, ELECTRICAL K1 TO L1	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940005045877	00779	36808	..TERMINAL, LUG M6, 6 AWG	3
14	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-6-133	..STRAND, WIRE (MAKE FROM 3271-6-133 ON BULK ITEMS LIST CUT TO LENGTH 208MM + 25)	2
15	MFFZZ	MFFZZ	MFFZZ	MFFZZ		53421	TAG9T3-100B	..LAMINATE, LABEL COVER	3
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940008990260	00779	321598	..TERMINAL, LUG M12, 6 AWG	3
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20276	.LEAD, ELECTRICAL K2 TO L2	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20277	.LEAD, ELECTRICAL K3 TO L3	1
19	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-6-133	..STRAND, WIRE (MAKE FROM 3271-6-133 ON BULK ITEMS LIST CUT TO LENGTH 243 MM + 25)	1
								END OF FIGURE	

**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**OUTPUT TERMINAL BOARD REPAIR PARTS LIST**



**Figure 17. Output Terminal Board (Sheet 1 of 3).**

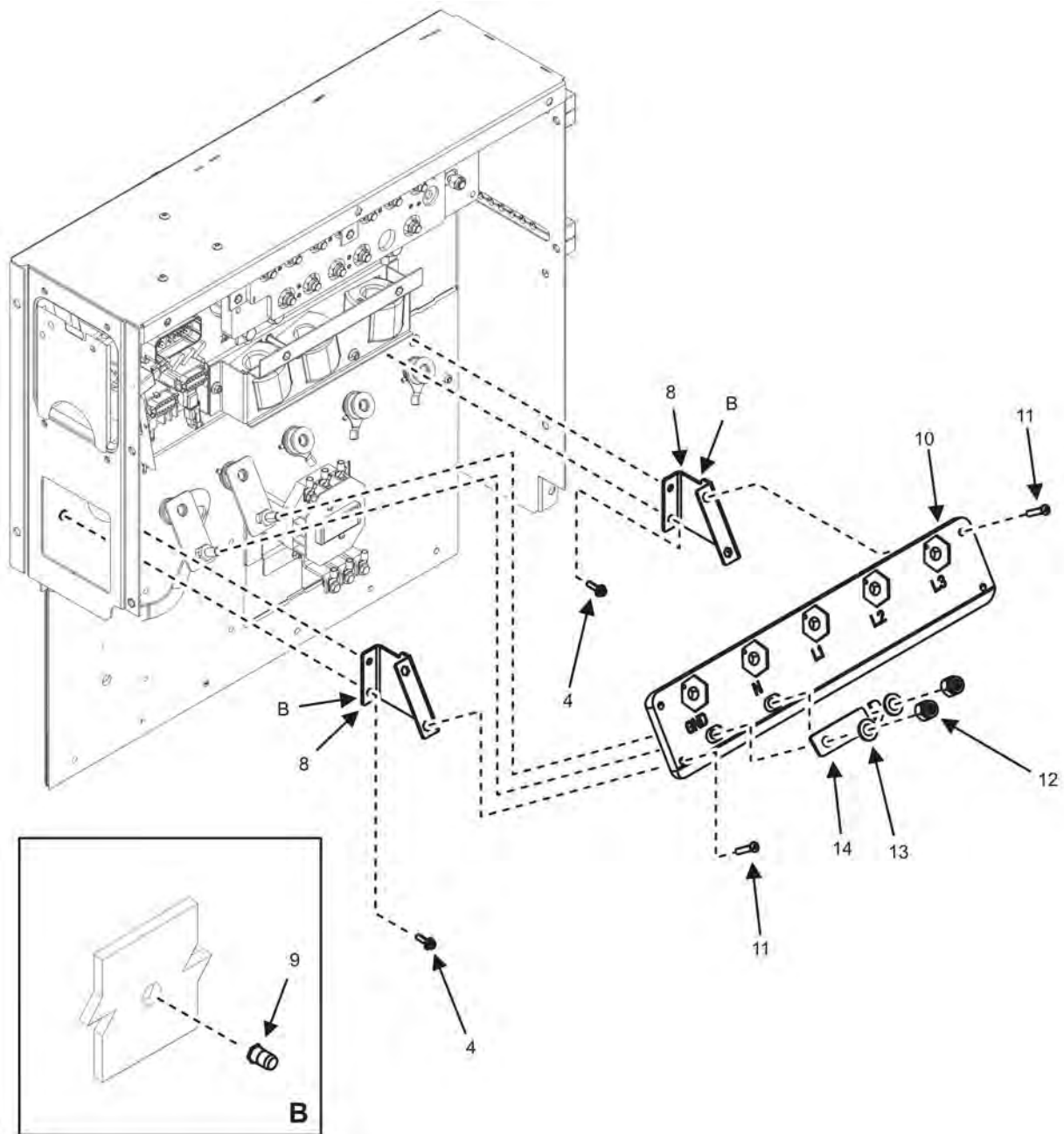


Figure 17. Output Terminal Board (Sheet 2 of 3).



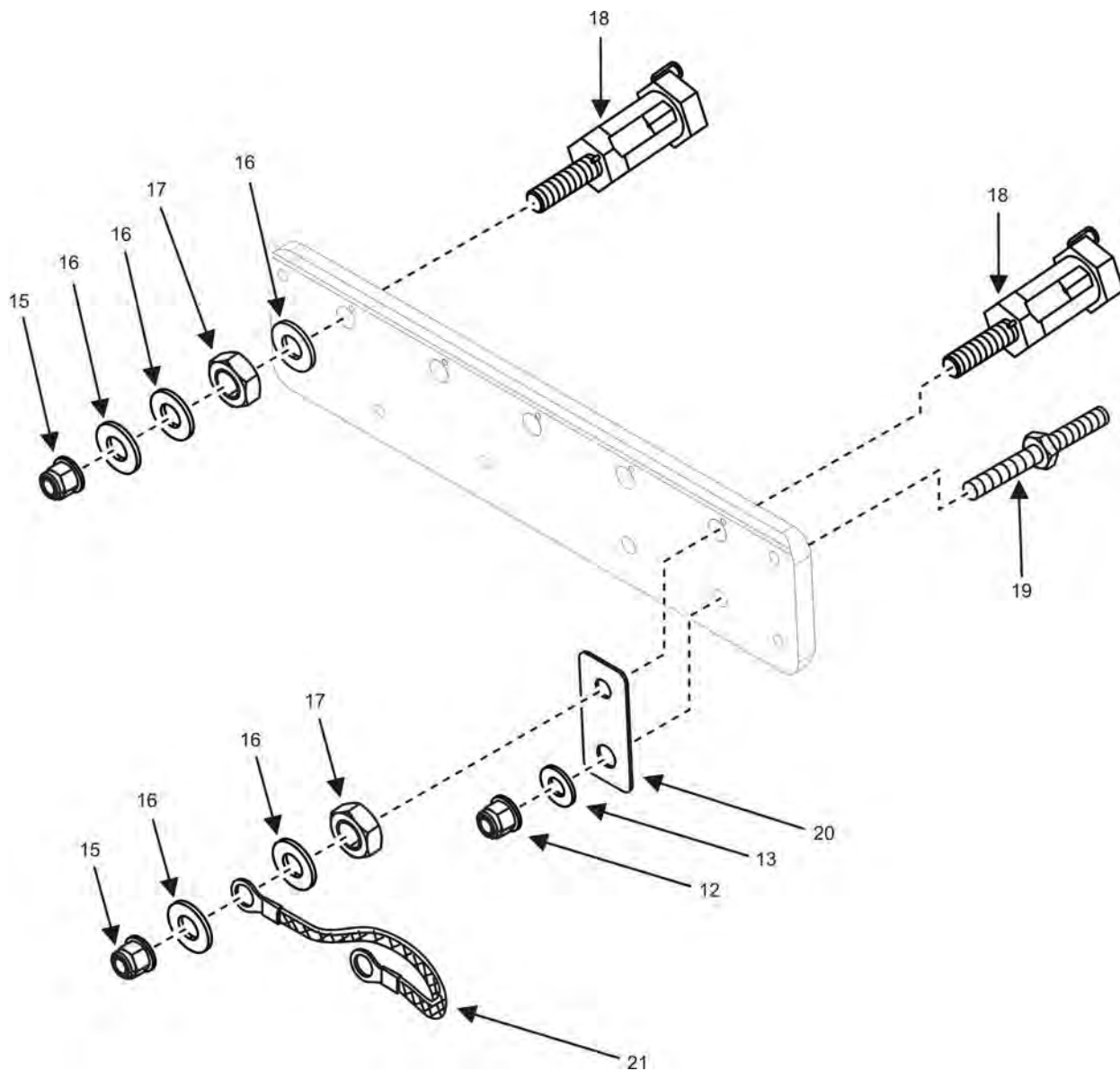


Figure 17. Output Terminal Board (Sheet 3 of 3).

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 0802	
								FIG. 17 OUTPUT TERMINAL BOARD	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21252	.GUARD, OUTPUT BOX	1
2	PAFFF	PAFFF	PAFFF	PAFFF	2990015957072	44940	04-21251	.GUARD, OUTPUT BOX	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5325015851529	78276	ALS4-610-6.6	..INSERT, THREADED	2
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015921168	05047	AES10M06A020WB4K42	.SCREW, HEX FLANGE HEAD M6 X 1 X 20	14
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		02768	354-310102-00-5869	.CLIP	7
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015971365	44940	04-20364	.HINGE, DOOR SHIELD	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21253	.DOOR, ACCESS	1
8	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20906	.BRACKET, MOUNTING	2
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893727	3A2G6	39101-76030	..NUT, PLAIN, CLINCH	4
10	PBFZZ	PBFZZ	PBFZZ	PBFZZ		44940	04-20236	.CONNECTION BOARD	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	B1834C06030N	.SCREW, SOCKET HEAD BUTTON M6 X 1 X 30	4
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014702044	30554	88-20568-3	.NUT, LOCK	4
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014664926	30554	88-20564-14	.WASHER, FLAT	4
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20665	.BUSBAR, NEUTRAL	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ		1MMD1	50CNTEAZ	.NUT, LOCK	5
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015894140	3A054	95395A250	.WASHER, FLAT	15
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310001898467	30554	88-22336-1	.NUT, PLAIN, HEXAGON	5
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940002372703	96906	MS39347-5	.TERMINAL, STUD	5
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940010038579	30554	72-2236	.TERMINAL, STUD	2
20	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-20666	.BUSBAR, GROUND	2
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6145015886489	5T0Q1	EM4H710	.STRAP, GROUNDING	1
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
VOLTAGE SELECTION BOARD REPAIR PARTS LIST

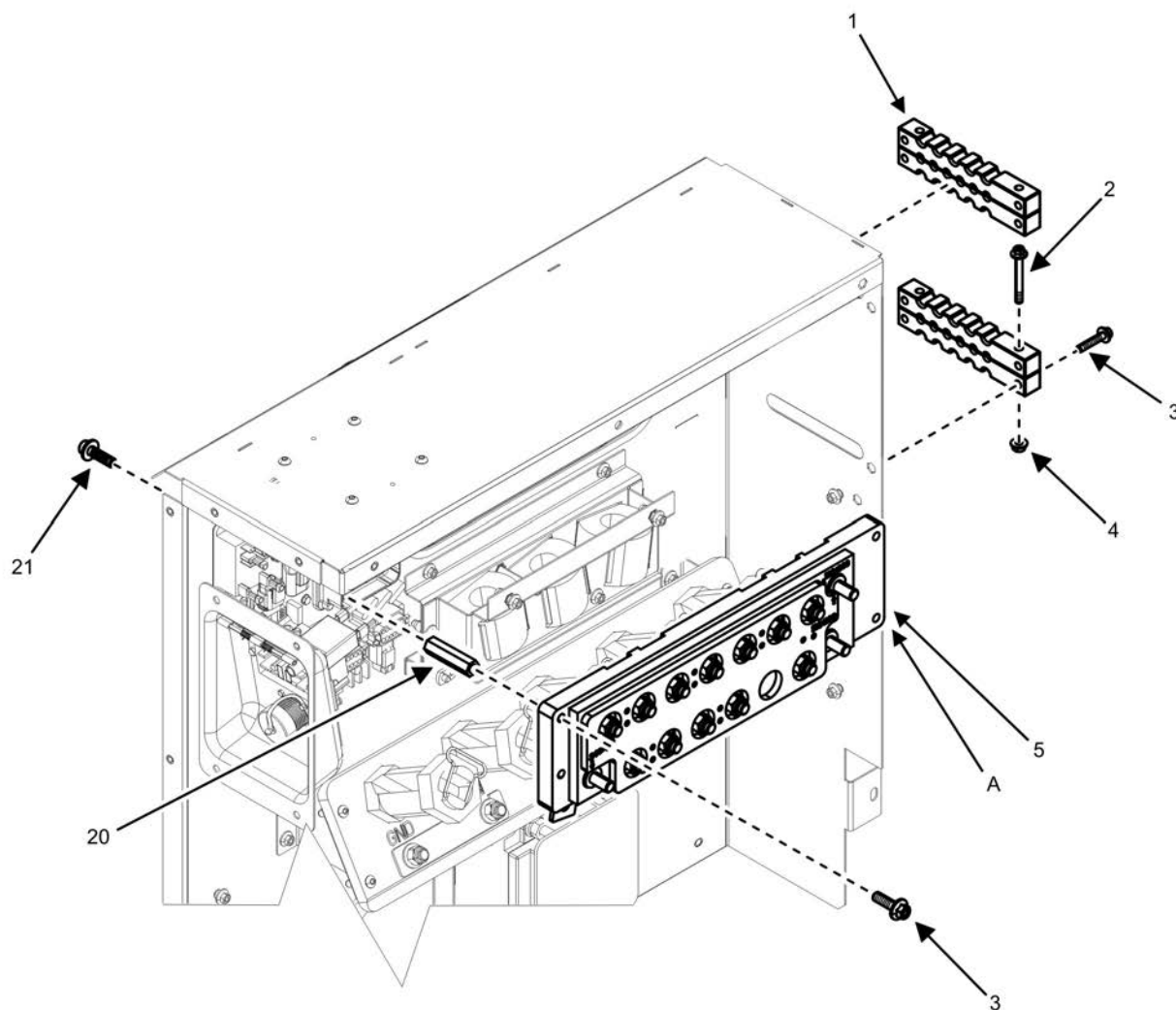


Figure 18. Voltage Selection Board (Sheet 1 of 6).

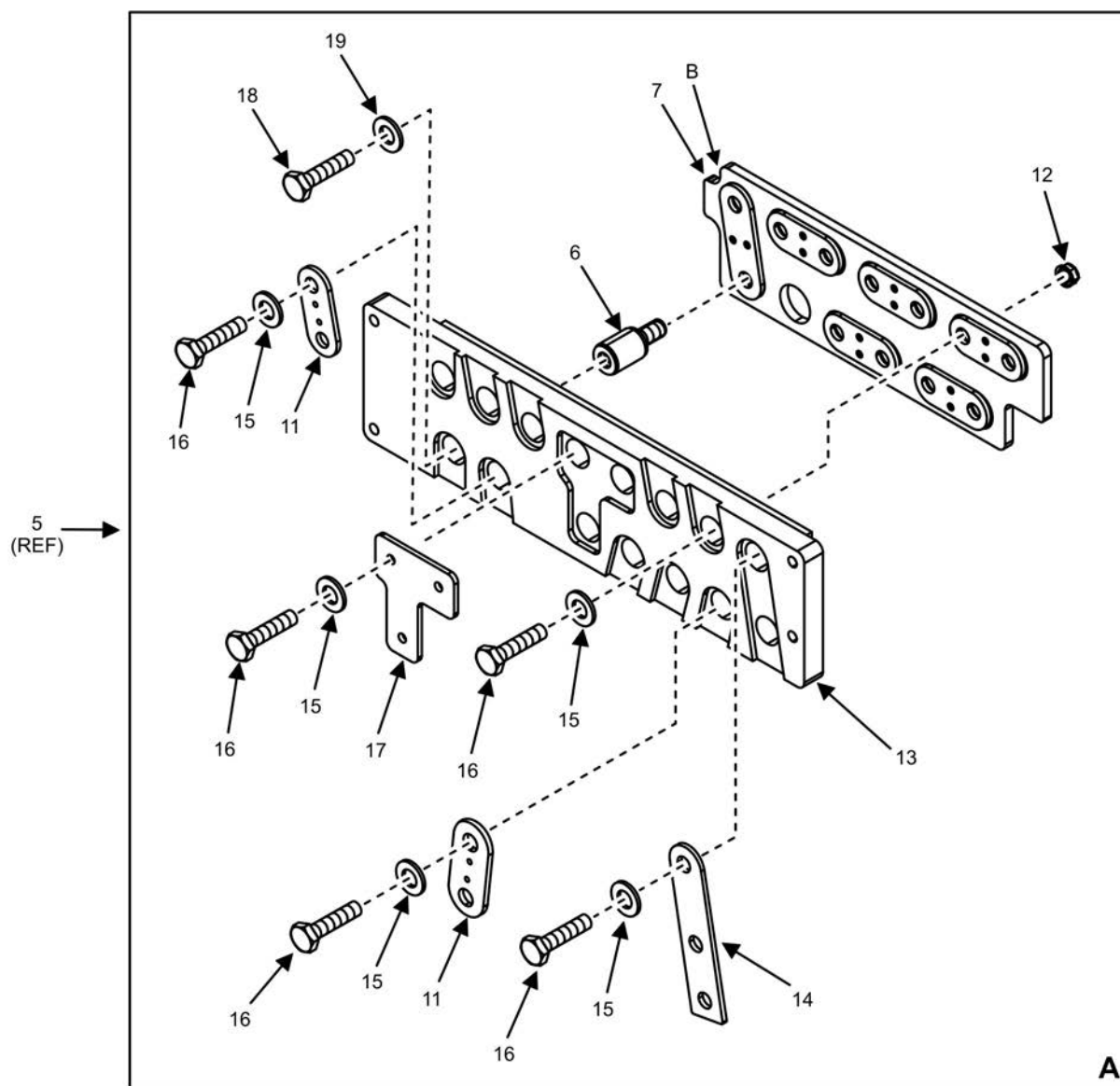


Figure 18. Voltage Selection Board (Sheet 2 of 6).

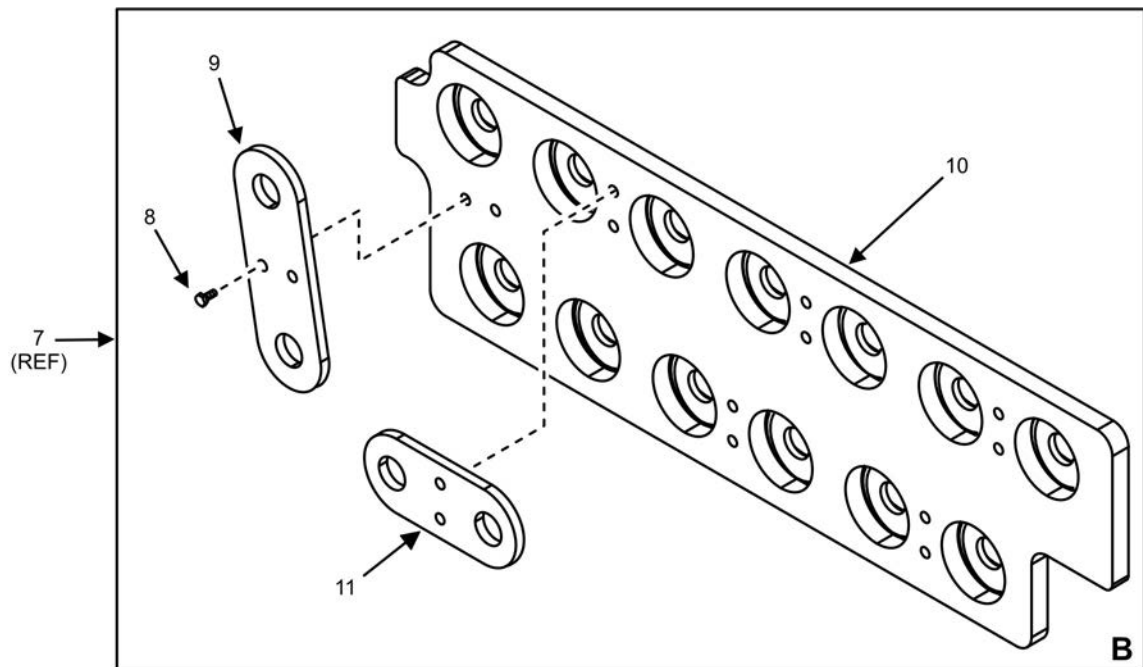


Figure 18. Voltage Selection Board (Sheet 3 of 6).

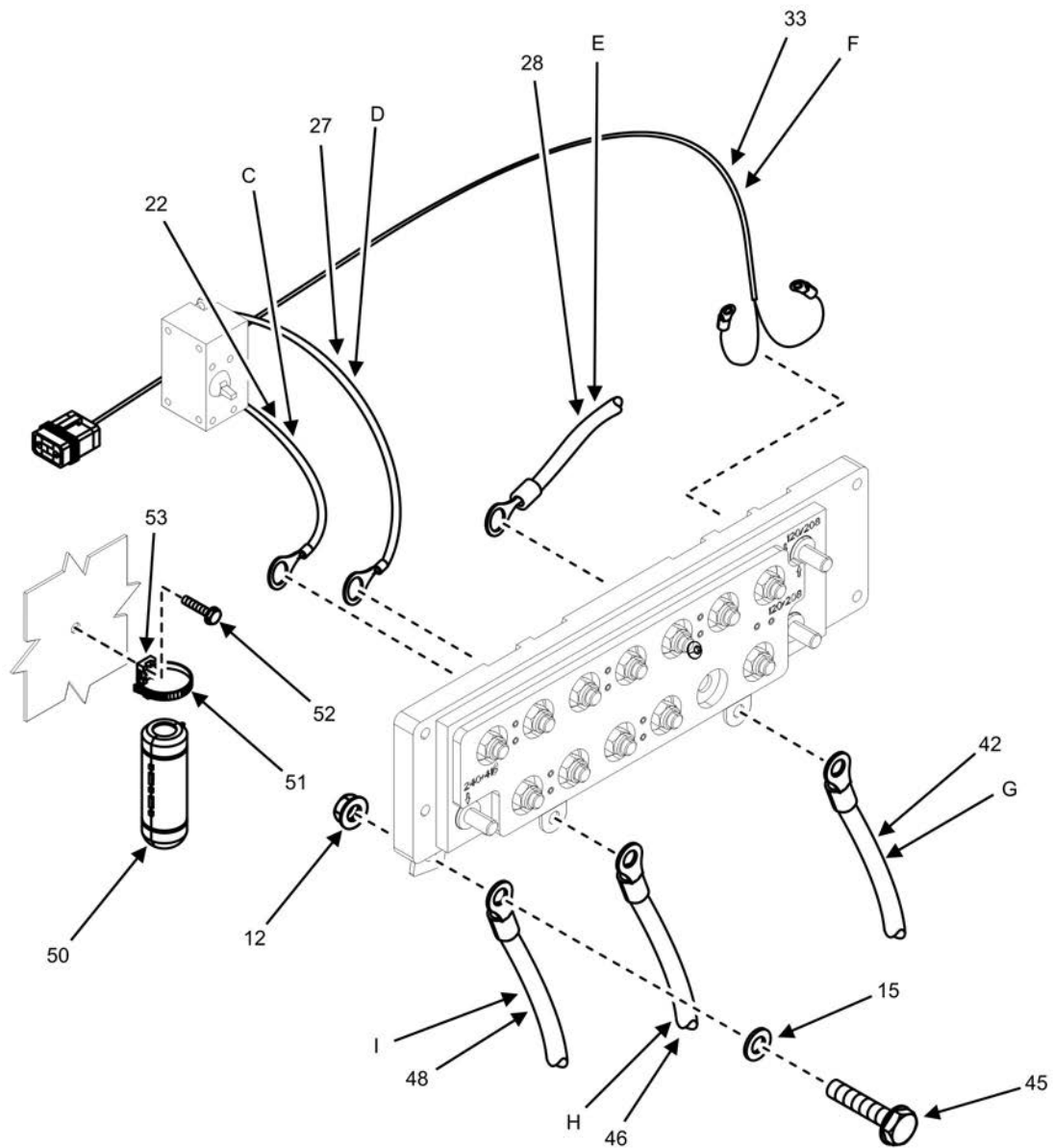


Figure 18. Voltage Selection Board (Sheet 4 of 6).

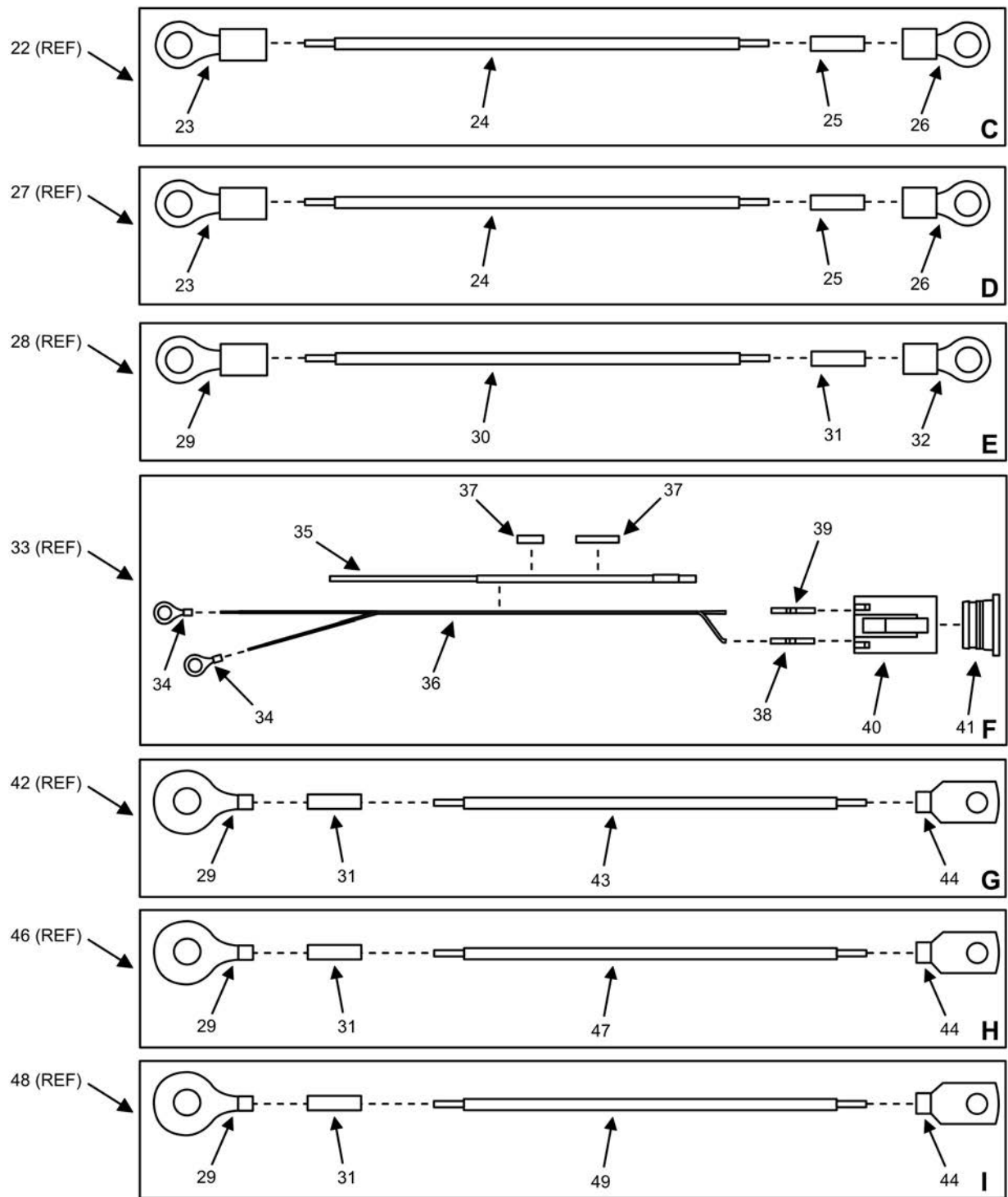


Figure 18. Voltage Selection Board (Sheet 5 of 6).

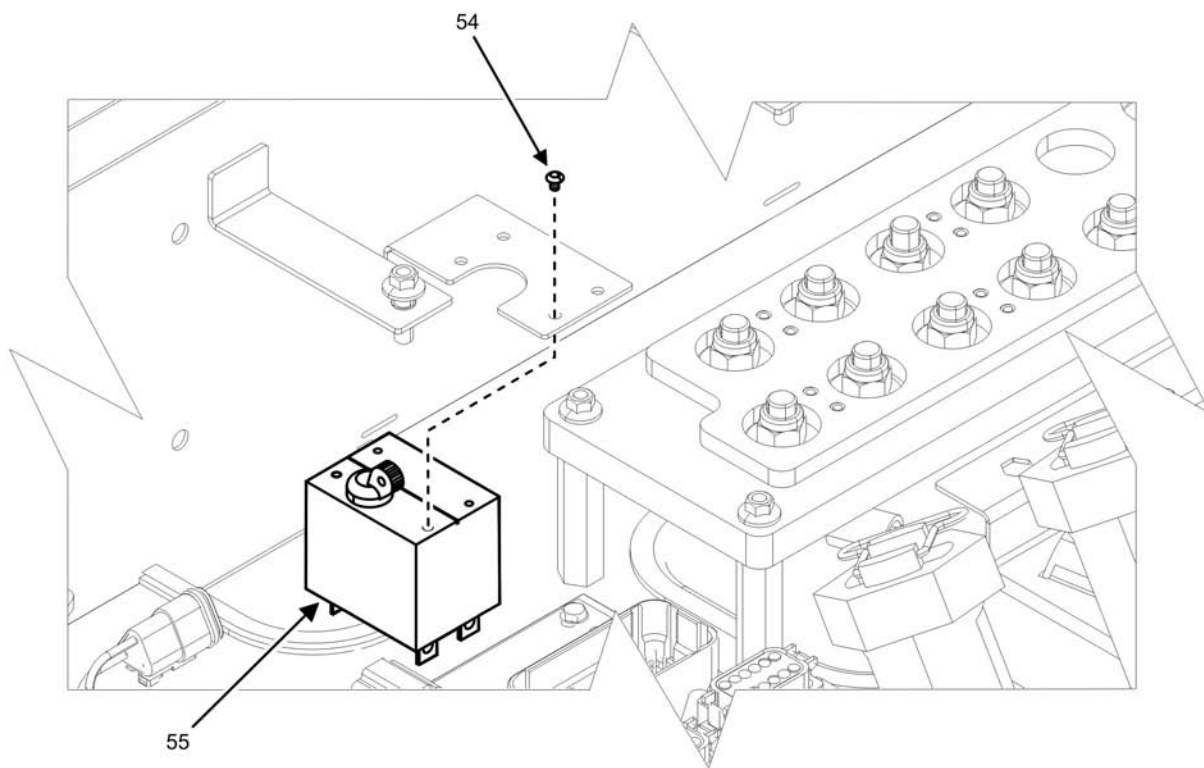


Figure 18. Voltage Selection Board (Sheet 6 of 6).



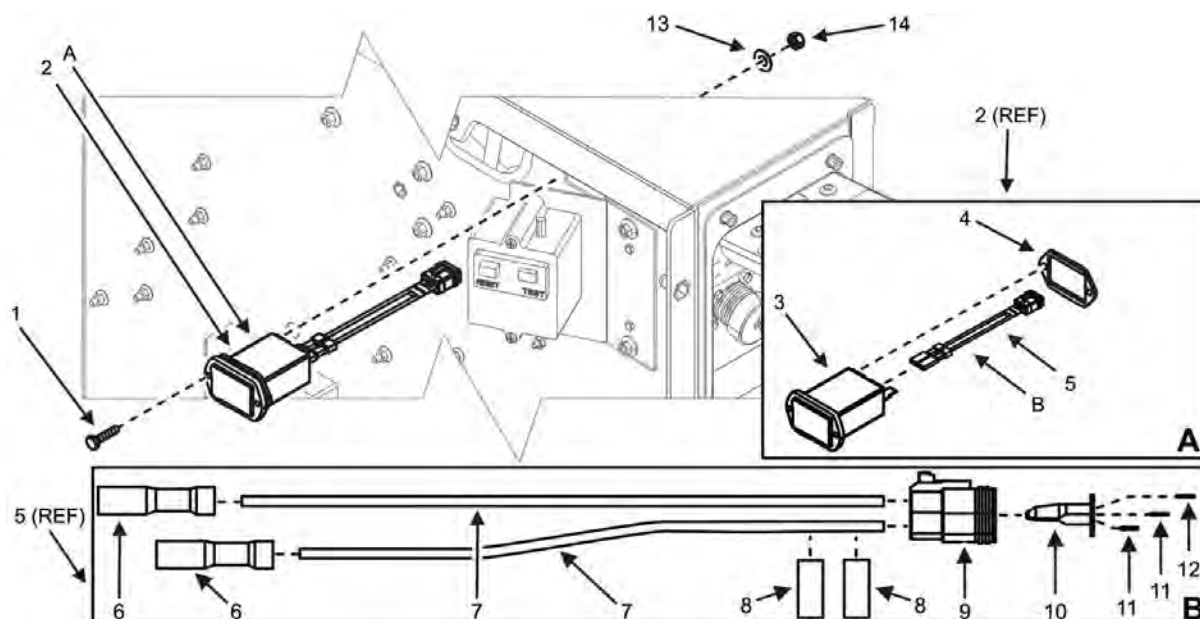
(1)	(2)				(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
									GROUP 0803	
									FIG. 18 VOLTAGE SELECTION BOARD	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015928036	44940	04-21481	.RETAINER, FINGER	4	
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		05047	AES10M06A050WB4K 42	.SCREW, HEX FLANGE HEAD M6 X 1 X 50	4	
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015980197	05047	AES10M06A030WB4K 42	.SCREW, HEX FLANGE HEAD M6 X 1 X 30	8	
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	.NUT, PAIN M6 X 1	4	
5	PAFFF	PAFFF	AFFZZ	AFFZZ		44940	04-21445	.RECONNECTION BOARD	1	
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	MS51831B201	..INSERT, THREADED	2	
7	PAFFF	PAFFF	AFFZZ	AFFZZ		44940	04-20913	..BOARD, RECONNECTION	1	
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEV28X120500BEZA11	...EYELET, METALLIC	12	
9	XAFZZ	XAFZZ	XAFZZ	XAFZZ		44940	04-21479	...BUSBAR, COPPER RECONNECTION	1	
10	XAFZZ	XAFZZ	XAFZZ	XAFZZ		44940	04-21434	...BOARD, RECONNECTION	1	
11	XAFZZ	XAFZZ	XAFZZ	XAFZZ		44940	04-20787	...BUSBAR, COPPER	7	
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014702044	30554	88-20568-3	..NUT, SELF-LOCKING	15	
13	XBFZZ	XBFZZ	XBFZZ	XBFZZ	5940015907509	44940	04-21435	..BOARD, RECONNECTION	1	
14	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21477	..BUSBAR, LOAD	1	
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ		81348	FF-W-92 TYPE A CLE GRI	..WASHER, FLAT 3/8	16	
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES01C375625BS8A11	..BOLT, HEX HEAD 3/8-16 INCH X .625 INCH	13	
17	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21478	..BUSBAR, COPPER	1	
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES1F190625BS8A11	..BOLT, HEX HEAD 10-31 INCH X.625 INCH	2	
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEWX26X19RUA2A11	..WASHER, FLAT	2	
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20791	.SPACER, MOUNTING	4	
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ		5305015921168	05047	AES10M06A020WB4K 42	.SCREW, HEX FLANGE HEAD M6 X 1 X 20	4
22	PAFFF	PAFFF	PAFFF	PAFFF	6150015909906	44940	04-20923-2	.LEAD, ELECTRICAL S501 TO CB502	1	
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4010015906749	00779	2-320564-3	..TERMINAL, LUG	2	
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0X4C9	3271-16-26	..STRAND, WIRE (MAKE FROM 3271-16-26 ON BULK ITEMS LIST CUT TO LENGTH 220 MM + 25)	2	
25	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG2T5-100B	..LAMINATE, LABEL COVER	2	
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ		00779	51864-5	..TERMINAL, LUG	2	
27	PAFFF	PAFFF	PAFFF	PAFFF	6150015909899	44940	04-20923-1	.LEAD, ELECTRICAL S501 TO CB502	1	
28	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-21347	UOC: 98M ONLY .LEAD, ELECTRICAL NEUTRAL	1	
29	PAFZZ	PAFZZ	PAFZZ	PAFZZ		5940006886010	96906	MS20659-10	..TERMINAL, RING 3/8, 6 AWG	4

(1)	(2)				(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
30	MFFZZ	MFFZZ	MFFZZ	MFFZZ		OX4C9	3271-6-133		..STRAND, WIRE (MAKE FROM 3271-6-133 ON BULK ITEMS LIST CUT TO LENGTH 1042 MM + 25)	1
31	MFFZZ	MFFZZ	MFFZZ	MFFZZ		53421	TAG9T3-100B		..LAMINATE, LABEL COVER	4
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940005045877	00779	36808		..TERMINAL, RING M12, 6 AWG	1
33	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20901		..HARNES, WIRING J503 TO S501	1
34	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940005577870	91967	01552		..TERMINAL, RING #8 INCH STUD, 22-16 AWG	2
35	MFFZZ	MFFZZ	MFFZZ	MFFZZ		3SXL3	55PP02872757640064		..INSULATION SLEEVEING (MAKE FROM 55PP02872757640064 ON BULK ITEMS LIST CUT TO LENGTH AS NEEDED)	1
36	MFFZZ	MFFZZ	MFFZZ	MFFZZ		OX4C9	3271-20-10		..STRAND, WIRE (MAKE FROM 3271-20-10 ON BULK ITEMS LIST CUT TO LENGTH AS NEEDED)	1
37	MFFZZ	MFFZZ	MFFZZ	MFFZZ		53421	TAG26T6-100B		..LAMINATE, LABEL	2
38	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012036687	11139	2ER654		..CONTACT, ELECTRICAL	2
39	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935011741235	11139	114017		..PLUG, END SEAL, ELECTRICAL	2
40	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014846537	11139	DT06-4S		..CONNECTOR, PLUG, ELECTRICAL	1
41	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014830852	11139	W4S		..CONNECTOR, RECEPTACLE	1
42	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20280		..LEAD, ELECTRICAL K3 TO T3	1
43	MFFZZ	MFFZZ	MFFZZ	MFFZZ		OX4C9	3271-6-133		..WIRE, STRANDED (MAKE FROM 3271-6-133 ON BULK ITEMS LIST CUT TO LENGTH 300 MM + 25)	1
44	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940008990260	00779	321598		..TERMINAL, RING M6, 6 AWG	3
45	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015928036	05047	AES10M06A050WB4K42		..BOLT, MACHINE	3
46	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20279		..LEAD, ELECTRICAL K2 TO T2	1
47	MFFZZ	MFFZZ	MFFZZ	MFFZZ		OX4C9	3271-6-133		..WIRE, STRANDED (MAKE FROM 3271-6-133 ON BULK ITEMS LIST CUT TO LENGTH 296 MM + 25)	1
48	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20278		..LEAD, ELECTRICAL K1 TO T1	1
49	MFFZZ	MFFZZ	MFFZZ	MFFZZ		OX4C9	3271-6-133		..WIRE, STRANDED (MAKE FROM BULK ITEMS LIST CUT TO LENGTH 302 MM + 25)	1

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
50	PAFZZ	PAFZZ	PAFZZ	PAFZZ		2S894	28A0807-0A2	.FILTER, CHOKE SHUNT	
51	PAFZZ	PAFZZ	PAFZZ	PAFZZ		06383	PLT4S-M30	UOC: 98M ONLY	1
52	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES46M06A018WA3A41	.. CABLE TIE	1
53	PAFZZ	PAFZZ	PAFZZ	PAFZZ		1JNO2	561-TA00600	UOC: 98M ONLY	4
54	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES46M30540NWA3A41	.SCREW, BUTTON HEAD SOCKET M6 X 1	1
55	PAFFF	PAFFF	PAFFF	PAFFF	6150015900171	81541	IUG66-1-43-10.0-AB-01	UOC: 98M ONLY	1
								.CIRCUIT BREAKER	1
								UOC: 98M ONLY	
								<b>END OF FIGURE</b>	



**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**HOURLY METER REPAIR PARTS LIST**



**Figure 19. Hour Meter.**

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 0804									
FIG. 19 HOUR METER									
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN933-M3X16	..SCREW, HEX HEAD M3 X 0.5	2
2	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20232	..HOUR METER ASSEMBLY	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		74400	085127-12	..METER, TIME	1
4	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5330015894667	74400	81683	..GASKET	1
5	PAFFF	PAFFF	PAFFF	PAFFF	6150015860411	44940	04-20453	..WIRING HARNESS	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015860213	30554	88-20275-3	...TERMINAL, DISCONNECT	2
7	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-16-26	...WIRE, STRANDED 16 AWG (MAKE FROM 3271-16-26 ON BULK ITEMS LIST CUT TO LENGTH 172.3MM +/-3)	1
8	MFFZZ	MFFZZ	MFFZZ	MFFZZ		53421	TAG2T5-100B	...LAMINATE, LABEL	2
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015238855	11139	DT06-3S	...CONNECTOR, PLUG 3 PIN	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935011741235	11139	114017	...PLUG, END SEAL, ELECTRICAL SIZE 12, 16	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012036687	45152	2ER654	...CONTACT, ELECTRICAL	2
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014708342	11139	W3S	...POLARIZING KEY, ELECTRICAL	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310993711050	KE489	DIN 125 M3	..WASHER, FLAT M3	2
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN934-M3	..NUT, HEX M3 X 0.5	2
END OF FIGURE									



FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
CONVENIENCE RECEPTACLE REPAIR PARTS LIST

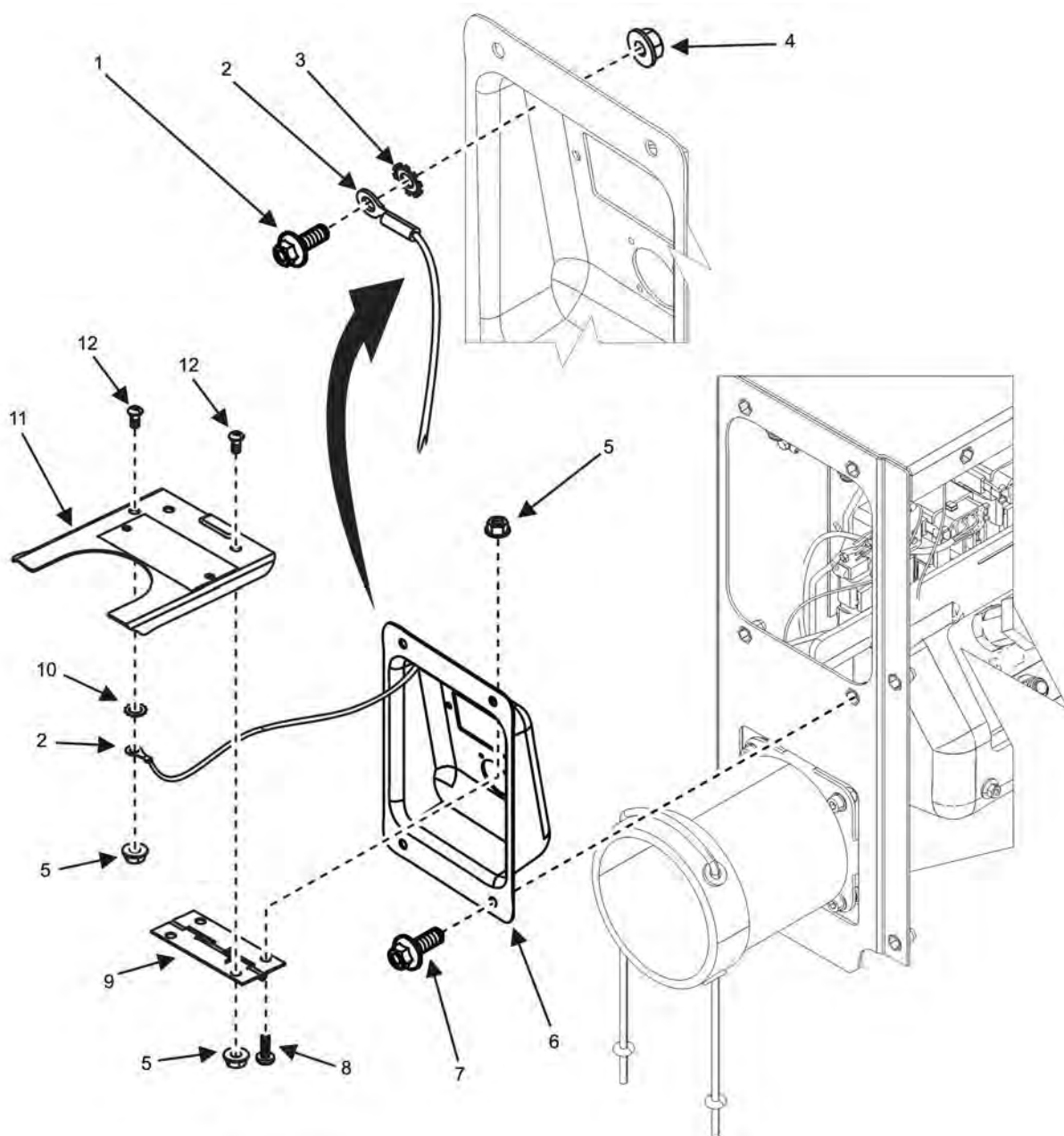


Figure 20. Convenience Receptacle (Sheet 1 of 6).

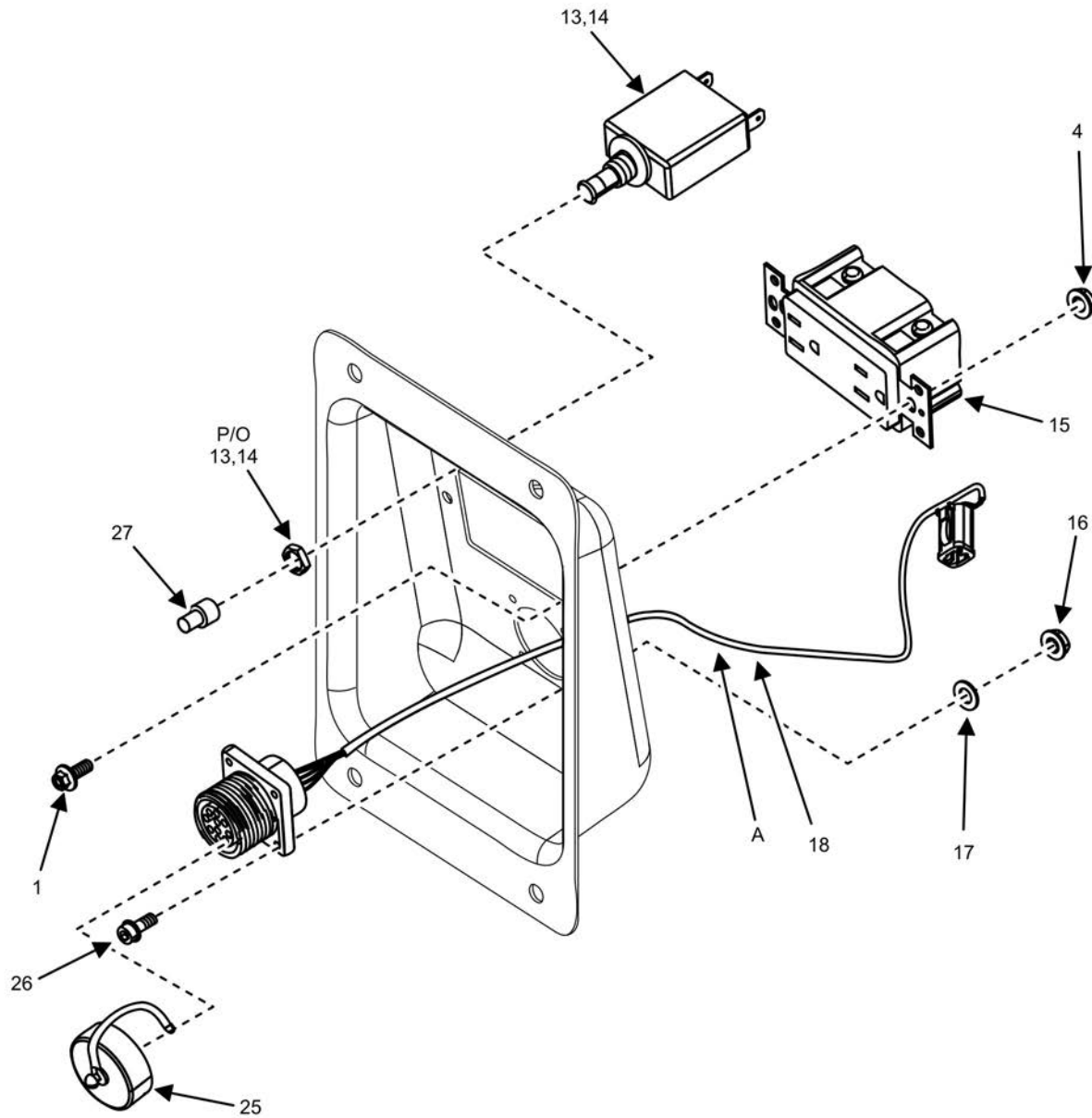


Figure 20. Convenience Receptacle (Sheet 2 of 6).



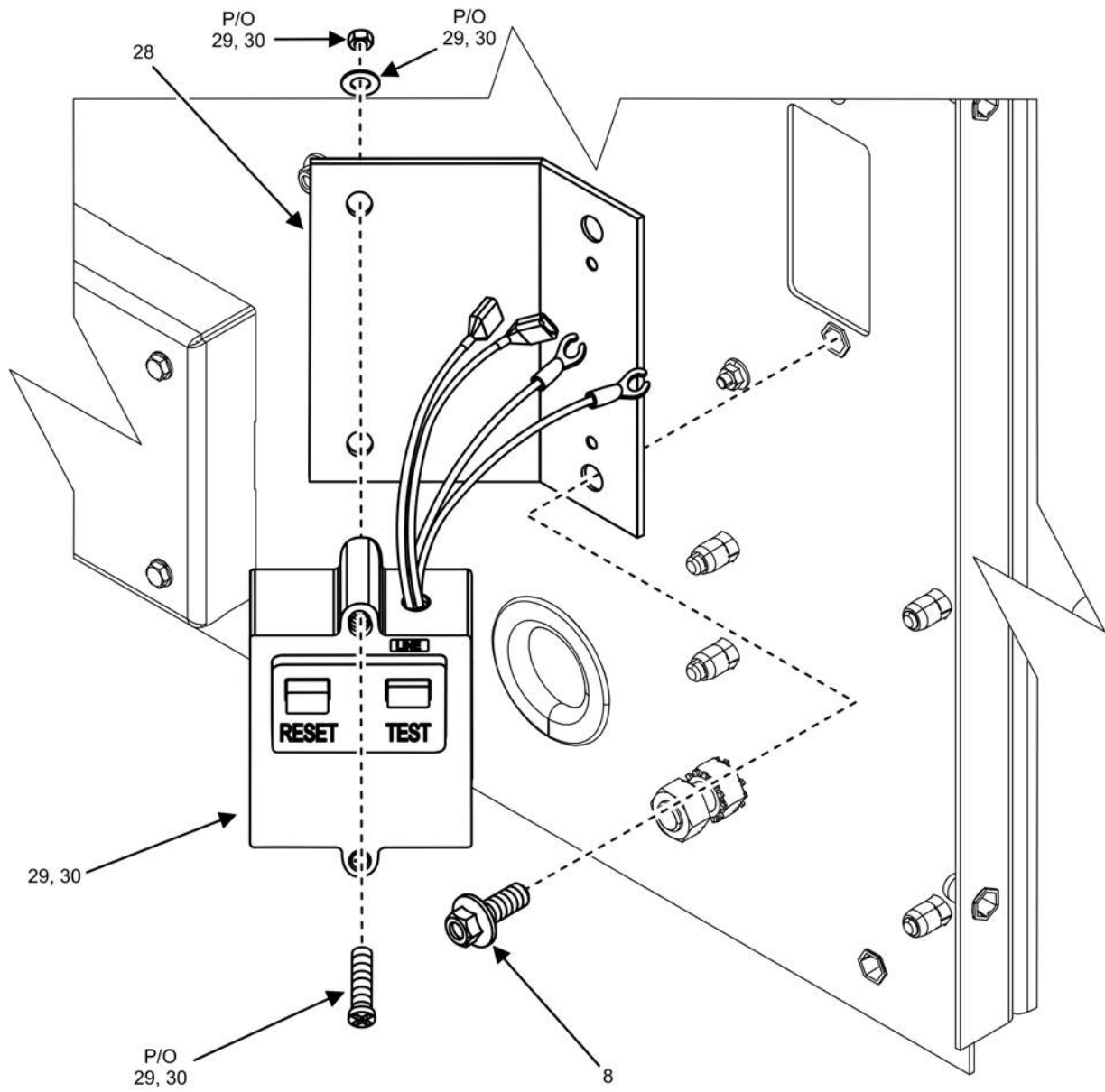


Figure 20. Convenience Receptacle (Sheet 3 of 6).

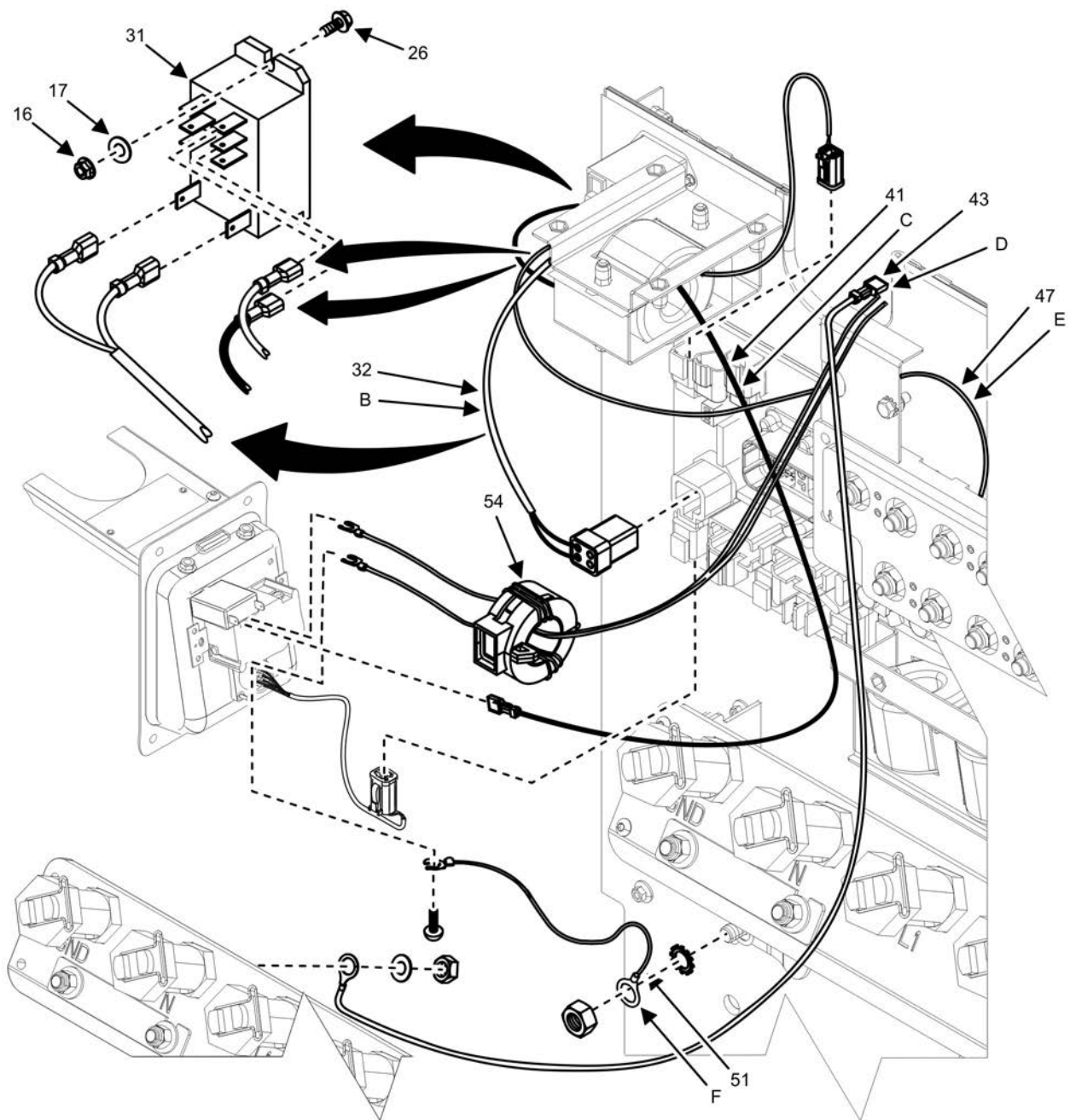


Figure 20. Convenience Receptacle (Sheet 4 of 6).

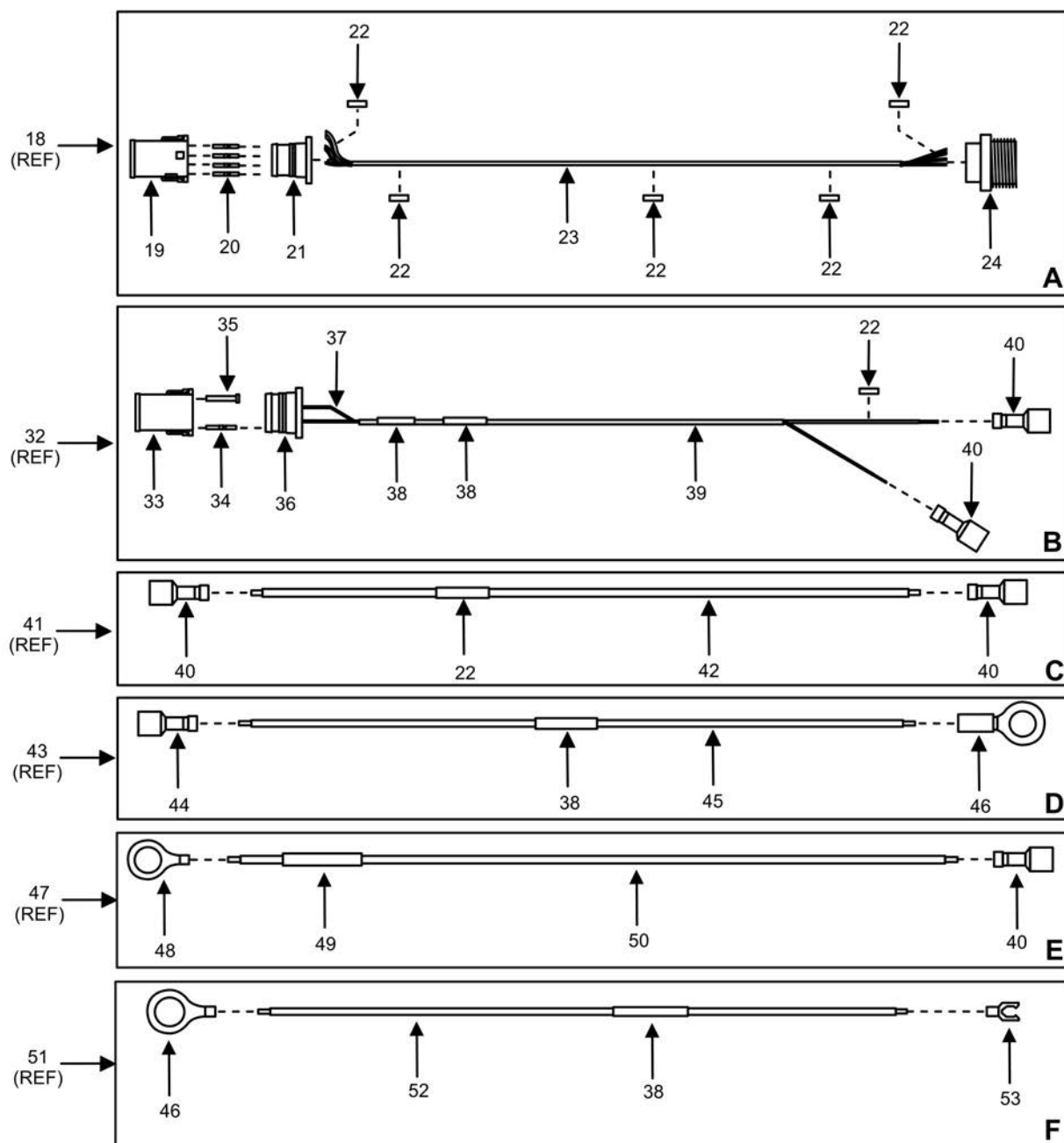


Figure 20. Convenience Receptacle (Sheet 5 of 6).

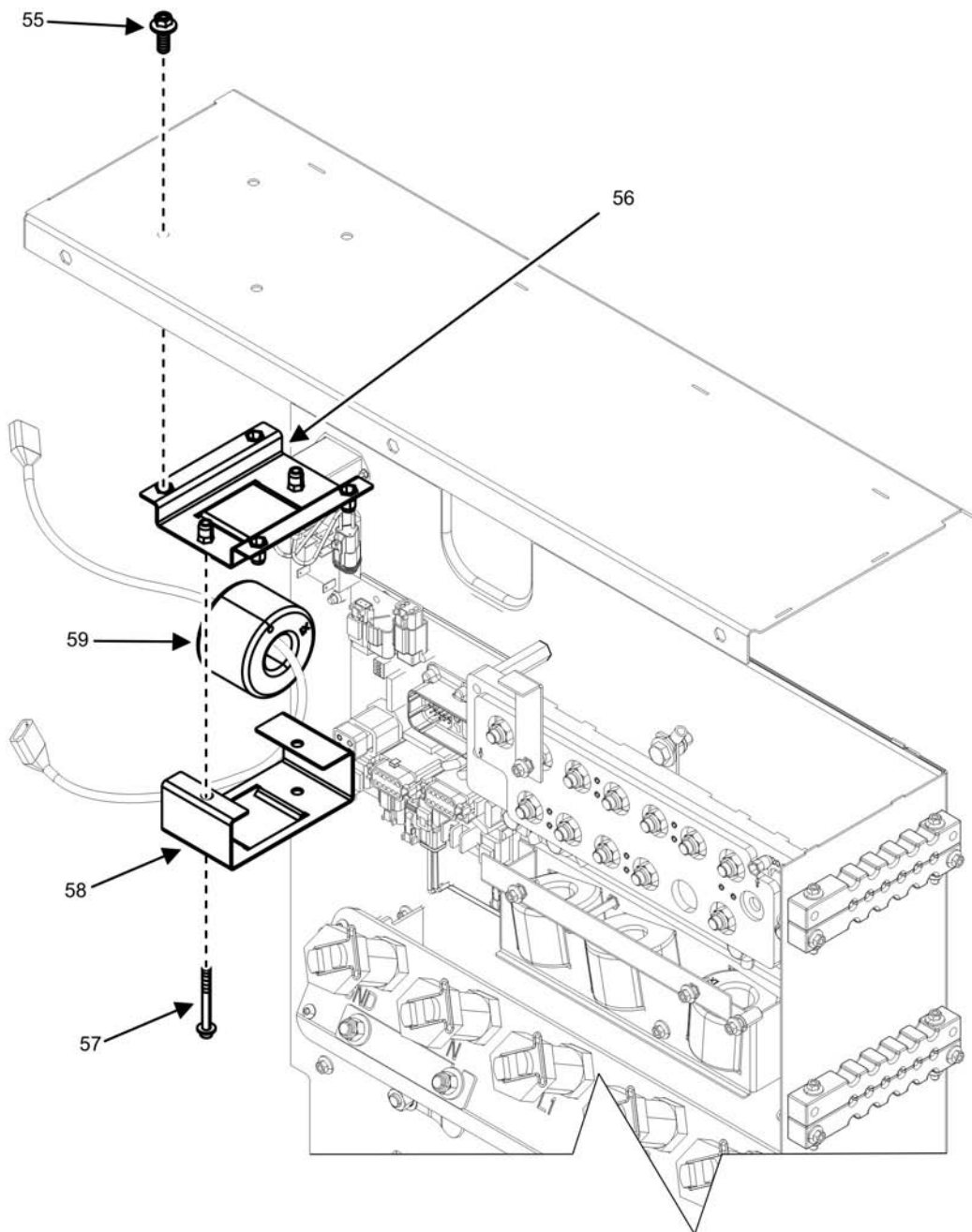


Figure 20. Convenience Receptacle (Sheet 6 of 6).

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 0805									
FIG. 20 CONVENIENCE RECEPTACLE									
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN931-M4X16	.SCREW, HEX HEAD	3
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-21318-1	.STRAP, ELECTRICAL GROUND	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015963732	05047	AEW13X164000GD5A 21	.WASHER LOCK, #8, EXT TOOTH	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M4	.NUT, HEX FLANGE (M4X0.7)	3
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	.NUT, HEX FLANGE (M6X1)	5
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20246	.HOUSING, RECEPTACLE, GFI BOX	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		4M343	44832	.SCREW, FLANGE HEAD	4
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015921168	05047	AES10M06A020WB4K 42	.SCREW, HEX FLANGE HEAD (M6X1X20)	4
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015933798	44940	04-20732	.HINGE, DOOR SPRING LOADED, CLOSED	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015963734	05047	AEW13X250000GD5A 21	.WASHER, LOCK 1/4 EXT TOOTH	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015878549	44940	04-20248	.PANEL, DOOR GFI BOX	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN7380A2-M6X12	.SCREW, CAP, SOCKET	3
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5925015860232	82647	PR11-62-15.0A-XX-V	.CIRCUIT BREAKER UOC: 98L	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5925015954319	82647	PR11-42-15.0A-XX-V	.CIRCUIT BREAKER UOC: 98M	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015956861	74545	DR20BLKWRTTR	.RECEPTACLE, DUPLEX	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN934-M3	.NUT, HEX (M3X0.5)	6
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN125-M3	.WASHER, FLAT M3	6
18	PAFFF	PAFFF	PAFFF	PAFFF	6150015860561	44940	04-20255	.HARNES, WIRING (J502 TO J522)	1
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014846537	11139	DT06-4S	..CONNECTOR, PLUG 4 PIN	1
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012036687	45152	2ER654	..CONTACT, SOCKET, 12 -16 AWG	4
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014830852	11139	W4S	..WEDGE, PLUG 4 PIN	1
22	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG2T5-100B	..LAMINATE, LABLE COVER	18
23	MFFZZ	MFFZZ	MFFZZ	MFFZZ	6145012521449	16428	89418	..CABLE, SHIELDED FOUR CONDUCTOR (MAKE FROM 89418 ON BULK ITEMS LIST CUT TO LENGTH 339 MM + 25)	1
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015906702	44940	MS3102R18-19SN	..CONNECTOR, PLUG 4 PIN	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	MS25043-18D	.COVER, ELECTRICAL CONNECTOR	1
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN933-M3X16	.SCREW, HEX HEAD (M3X0.5X16)	6

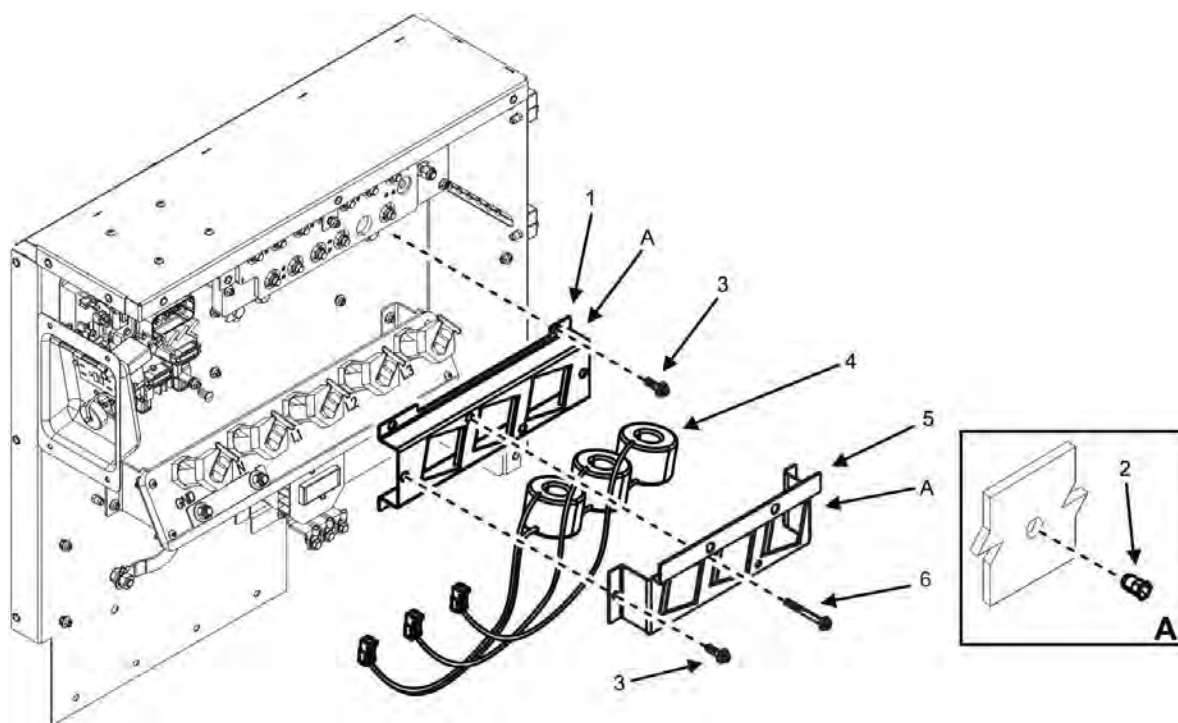
(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5930015900170	97539	1231/72	.BOOT, TERMINAL CIRCUIT BREAKER	1
28	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21674	.BRACKET, MOUNTING RELAY	1
29	PAFZZ	PAFZZ	PAFZZ	PAFZZ		60177	25970	. INTERRUPTER, GROUND FAULT 50/60 HZ	1
30	PAFZZ	PAFZZ	PAFZZ	PAFZZ		60177	25960	UOC: 98L .INTERRUPTER, GROUND FAULT 400 HZ	1
31	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5945014586605	77342	T92S11D22-24	UOC: 98M .RELAY, SOLID STATE	1
32	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20257	.LEAD ELECTRICAL, J508 TO RELAY	1
33	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015224172	11139	DTP06-4S	..CONNECTOR, PLUG, ELECTRICAL	1
34	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015518077	11139	1062-12-0166	..CONTACT, SOCKET 14-12 AWG	2
35	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935011741235	11139	114017	..CONNECTOR, PLUG SIZE 12, 16	2
36	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015121010	11139	WP-4S	..WEDGE, PLUG 4 PIN	1
37	MFFZZ	MFFZZ	MFFZZ	MFFZZ		OX4C9	3271-14-41	..WIRE, STRANDED 14 AWG (MAKE FROM 3271-14-41 ON BULK ITEMS LIST, CUT TO 277 MM + 25)	1
38	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG9T3-100B	..LAMINATE, LABEL COVER	5
39	MFFZZ	MFFZZ	MFFZZ	MFFZZ		3SXL3	55PP02872757640064	..SLEEVE, BRAIDED TPE YARN (MAKE FROM 55PP02872757640064 ON BULK ITEMS LIST, CUT TO LENGTH AS REQUIRED)	1
40	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015860213	30554	88-20275-3	..TERMINAL, DISCONNECT	8
41	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20922	.LEAD ELECTRICAL, K501 TO CB501	1
42	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	OX4C9	3271-16-26	..WIRE, STRANDED 16 AWG (MAKE FROM 3271-16-26 ON BULK ITEMS LIST, CUT TO LENGTH 329 MM + 25)	1
43	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-21703	.LEAD, ELECTRICAL, RECEPTACLE NEUTRAL	1
44	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940011390853	30554	88-20275-4	..TERMINAL RECEPTACLE	1

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
45	MFFZZ	MFFZZ	MFFZZ	MFFZZ		OX4C9	3271-16-26	..WIRE, STRANDED 14 AWG (MAKE FROM 3271-16-26 ON BULK ITEMS LIST, CUT TO 350 MM + 25)	1
46	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940006603633	81343	MS25036-155	..TERMINAL, RING 1/2 INCH RING, 16-14 AWG	2
47	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20781	..LEAD ELECTRICAL, K501 TO S501	1
48	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	2-320564-3	..TERMINAL, RING #10, 22-16 AWG	1
49	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG22T3-100B	..LAMINATE, LABEL COVER	1
50	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	OX4C9	3271-16-26	..WIRE, STRANDED 16 AWG (MAKE FROM 3271-16-26 ON BULK ITEMS LIST, CUT TO LENGTH 385 MM + 25)	1
51	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20982	..LEAD ELECTRICAL, J100 GND TO GND	1
52	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015906749	OX4C9	3271-16-26	..WIRE, STRANDED 16 AWG (MAKE FROM 3271-16-26 ON BULK ITEMS LIST, CUT TO LENGTH 434 MM + 25 MM)	1
53	PAFZZ	PAFZZ	PAFZZ	PAFZZ		00779	55768-1	..TERMINAL, SPADE M4, 22-16 AWG	1
54	PAFZZ	PAFZZ	PAFZZ	PAFSS		2S894	240-2128-ND	..FILTER, CHOKE, GFI	1
55	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES46M06A018WA3A11	..SCREW, BUTTON HEAD (M6X1.0)	4
56	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20105	..BRACKET, MOUNTING, CURRENT TRANSFORMER	1
57	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015963678	05047	AES10M06A055WB4K 42	..SCREW, HEX FLANGE HEAD (M6X1X55)	2
58	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20109	..BRACKET, MOUNTING, CURRENT TRANSFORMER	1
59	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0SFN7	A026F118	..TRANSFORMER, CURRENT 55 AMP	1
END OF FIGURE									





**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**TRANSFORMERS REPAIR PARTS LIST**

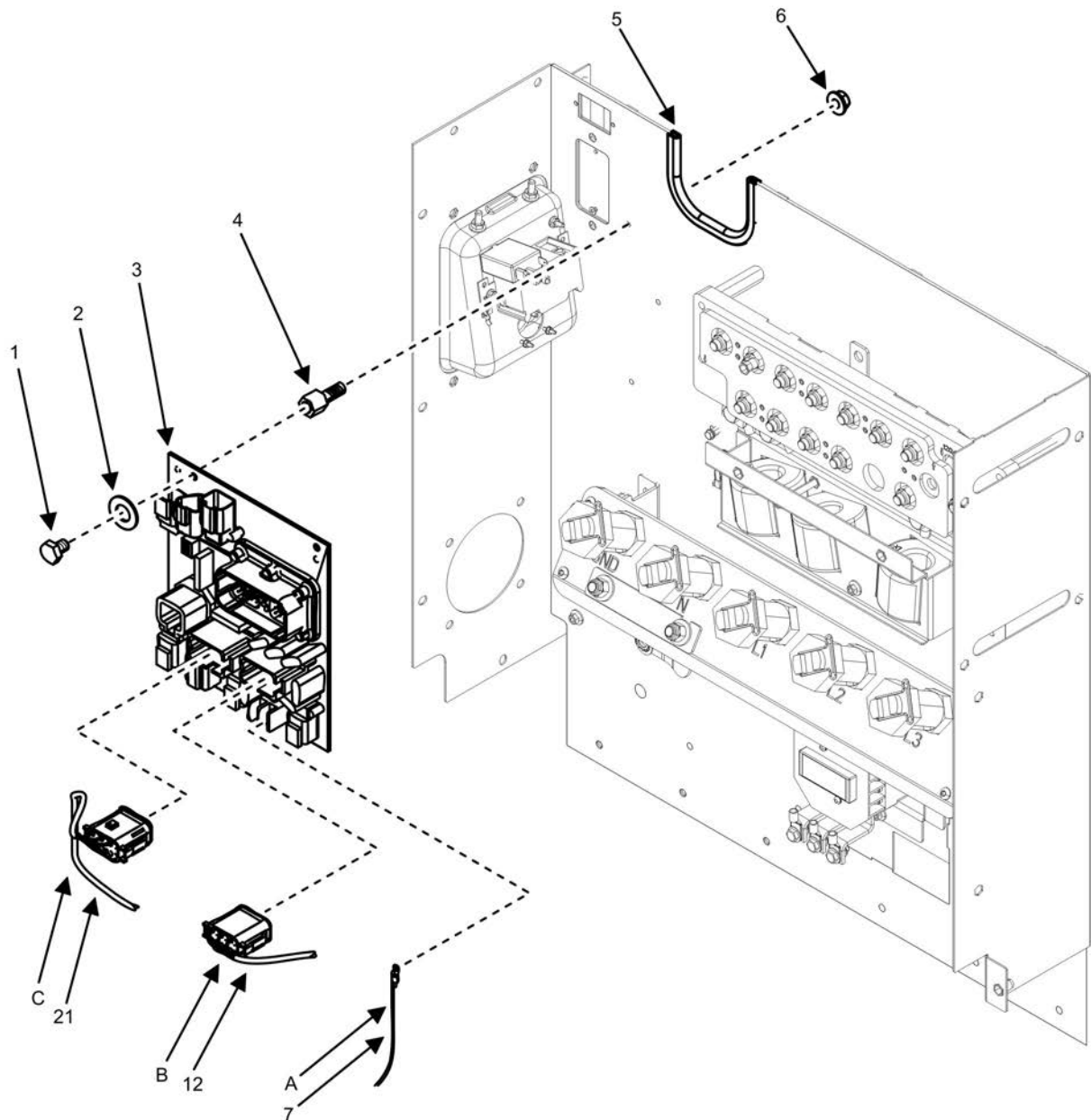


**Figure 21. Transformers.**

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 0806									
FIG. 21 TRANSFORMERS									
1	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20961	.BRACKET, MOUNTING	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015893727	3A2G6	39101-76030	..NUT, PLAIN, CLINCH	6
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015921168	05047	AES10M06A020WB4K42	.SCREW, HEX FLANGE HEAD M6 X 1 X 20	6
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0SFN7	A026F119	.TRANSFORMER, CURRENT	3
5	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20847	.BRACKET, MOUNTING	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015963678	05047	AES10M06A055WB4K42	.SCREW, HEX FLANGE HEAD M6 X 1 X 55	2
END OF FIGURE									



**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**PRINTED CIRCUIT BOARD MODULE REPAIR PARTS LIST**



**Figure 22. Printed Circuit Board Module (Sheet 1 of 2).**

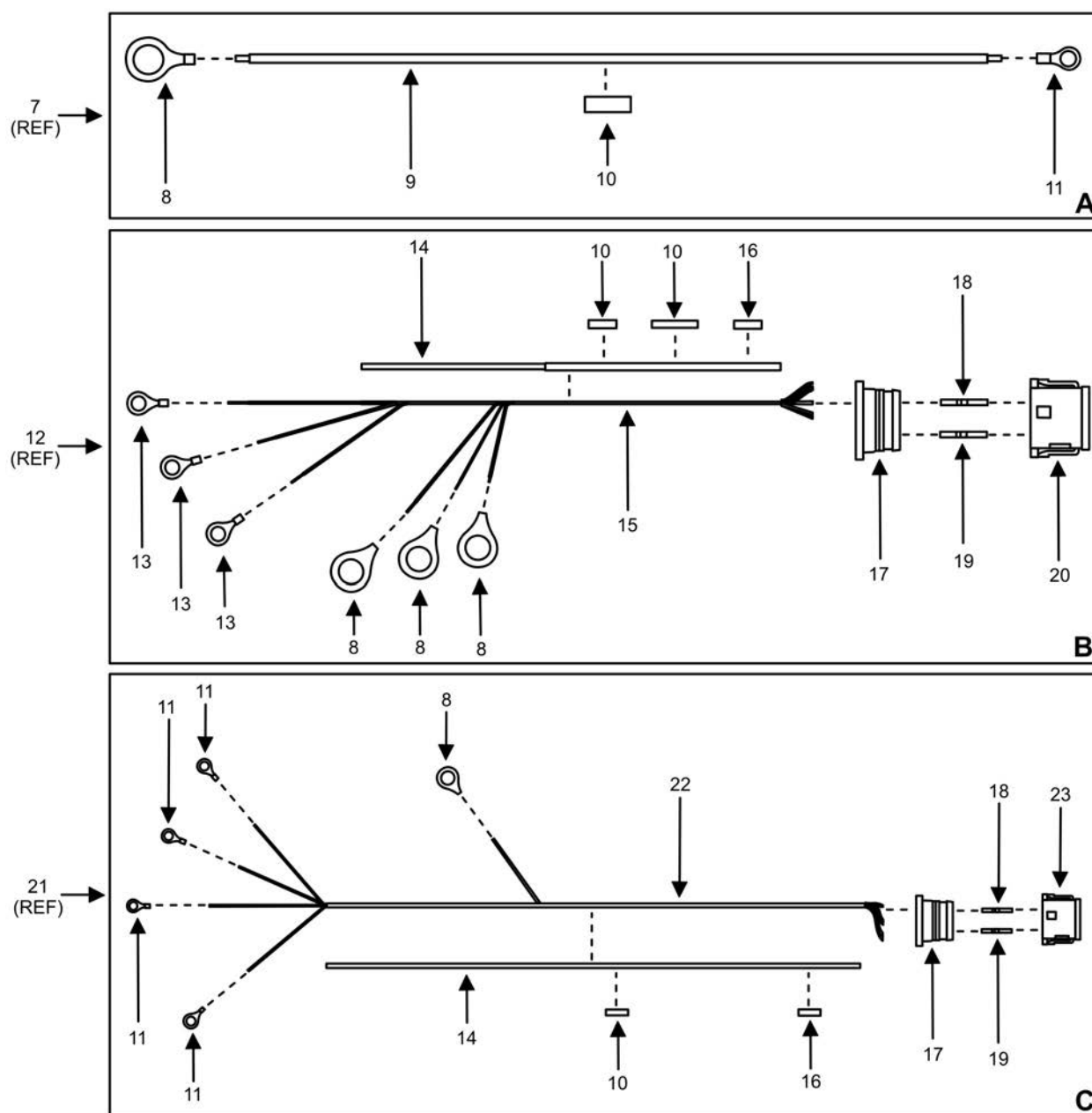
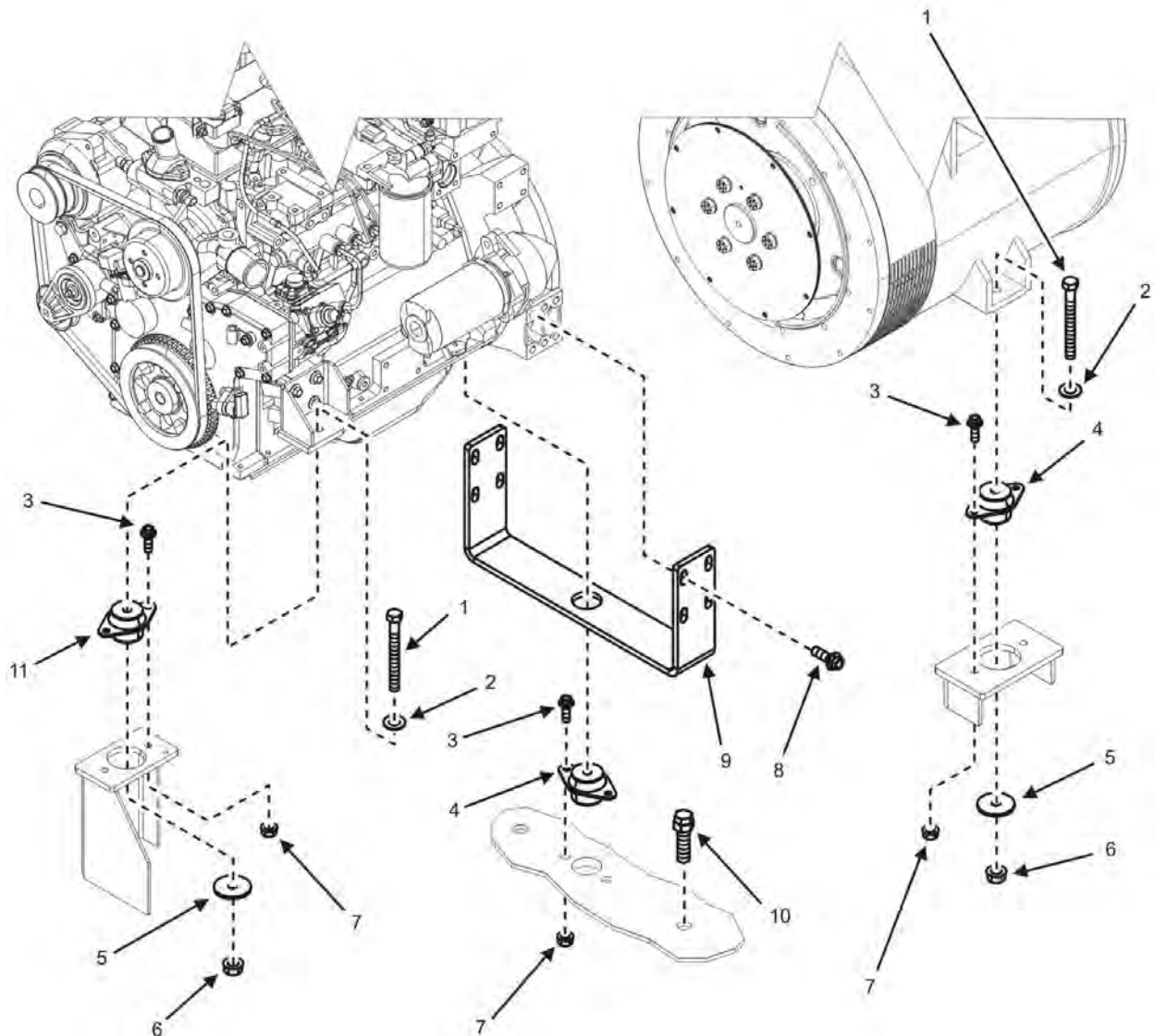


Figure 22. Printed Circuit Board Module (Sheet 2 of 2).

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 0807	
								FIG. 22 PRINTED CIRCUIT BOARD MODULE	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN931-M4X6	.SCREW, HEX HEAD	5
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014849183	1KWT0	085295	. WASHER, FLAT	5
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5998015860344	44940	A026K431	.MODULE, PRINTED CIRCUIT BOARD	1
4	XBFZZ	XBFZZ	XBFZZ	XBFZZ	5365015908328	04729	MMF1203M06F16M4	.SPACER, MOUNTING	5
5	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-20902-3	.EDGING (MAKE FROM A3521 ON BULK ITEMS LIST, CUT TO LENGTH 204 MM +/- 5)	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M4	.NUT, PLAIN, HEXAGON	5
7	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20988	.LEAD, ELECTRICAL A2-TB511 TO T501	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940006603633	81343	MS25036-155	..TERMINAL, RING 1/2 INCH, 16-14 AWG	5
9	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-16-26	..STRAND, WIRE (MAKE FROM 3271-16-26 ON BULK ITEMS LIST CUT TO LENGTH 300 MM + 50)	1
10	MFFZZ	MFFZZ	MFFZZ	MFFZZ		53421	TAG2T5-100B	..LAMINATE, LABEL COVER	12
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940004640117	00779	36152	..TERMINAL RING #6/M3.5, 22-16 AWG	5
12	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-21358	.HARNESSE, WIRING J501 TO K1/TB501	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ		00779	55936-2	..TERMINAL RING	3
14	MFFZZ	MFFZZ	MFFZZ	MFFZZ		3SXL3	55PP02872757640064	..INSULATION SLEEVING (MAKE FROM 55PP02872757640 064 ON BULK ITEMS LIST CUT TO LENGTH AS NEEDED)	2
15	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-16-26	..STRAND, WIRE 16 AWG (MAKE FROM 3271-16-26 ON BULK ITEMS LIST CUT TO LENGTH 590 MM + 50)	1
16	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG9T3-100B	..LAMINATE, LABEL COVER	4
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014541789	11139	W12S	.WEDGE, PLUG 12 PIN	2
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012036687	45152	2ER654	..CONTACT, ELECTRICAL	11
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935011741235	11139	114017	..PLUG, END SEAL	13

(1)	(2)			(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014953353	45152	7HA302	..CONNECTOR, PLUG, ELECTRICAL
21	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-21359	..HARNESS, WIRING J511 TO K1/TB501
22	MFFZZ	MFFZZ	MFFZZ	MFFZZ		OX4C9	3271-16-26	..STRAND, WIRE 16 AWG (MAKE FROM 3271-16-26 ON BULK ITEMS LIST CUT TO LENGTH 863 MM + 50)
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014953346	45152	8HA889	..CONNECTOR, PLUG, ELECTRICAL
END OF FIGURE								

**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**POWER PLANT INSTALLATION REPAIR PARTS LIST**



**Figure 23. Power Plant Installation (Sheet 1 of 2).**

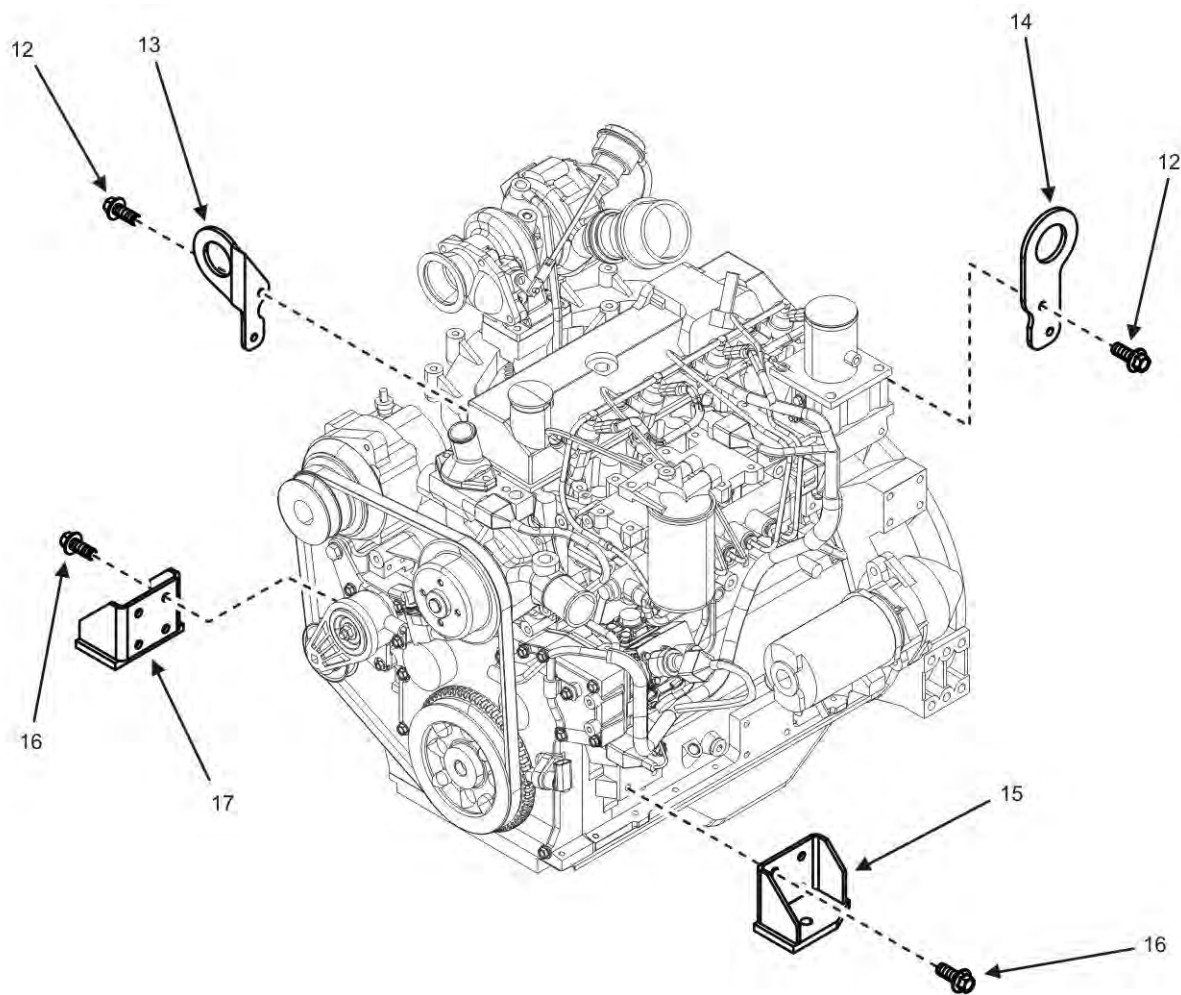


Figure 23. Power Plant Installation (Sheet 2 of 2).



(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC FORCE	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
							GROUP 09	
							FIG. 23 POWER PLANT INSTALLATION	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940 AEB02C500C50WA6FY1	.BOLT, HEX HEAD (1/2-13 INCH UNC X 3.5 INCH)	4
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014358312	39428 98025A133	.WASHER, FLAT (1/2 INCH)	4
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940 AES10M10C030WB4K42	.SCREW, HEX FLANGE HEAD (M10 X 1.5 X 30)	20
4	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5340015899949	81860 29552-4	.ISOLATOR, VIBRATION	4
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940 04-20749-3	.WASHER, SNUBBING	4
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015531219	27687 F51N7582-813	.NUT, SELF- LOCKING, HEX HEAD	4
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		2V507 92461A500	.NUT, HEX FLANGE (M10 X 1.5)	12
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940 AES10M12D030WB4K42	..SCREW, HEX FLANGE HEAD (M12 X 1.75 X 30)	8
9	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940 04-21238	..BRACKET, MOUNTING, ENGINE, REAR	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940 DIN931-M12X50	.SCREW, HEX HEAD CAP (M12 X 1.75 X 50)	2
11	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5340015966925	81860 29552-3	.ISOLATOR, VIBRATION	2
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0B8S3 C0143501020	.SCREW, HEX FLANGE HEAD CAP	4
13	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940 04-20346	..BRACKET, LIFTING, ENGINE, FRONT	1
14	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940 04-20345	..BRACKET, LIFTING, ENGINE, REAR	1
15	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940 04-20886	..BRACKET, MOUNTING, ENGINE, LEFT	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015963579	44940 AES10M10C025WB4K42	.SCREW, HEX FLANGE HEAD (M10 X 1.5 X 30)	8
17	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940 04-20887	..BRACKET, MOUNTING, ENGINE, RIGHT	1
							END OF FIGURE	



FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
AC GENERATOR ASSEMBLY, 50/60 HZ REPAIR PARTS LIST

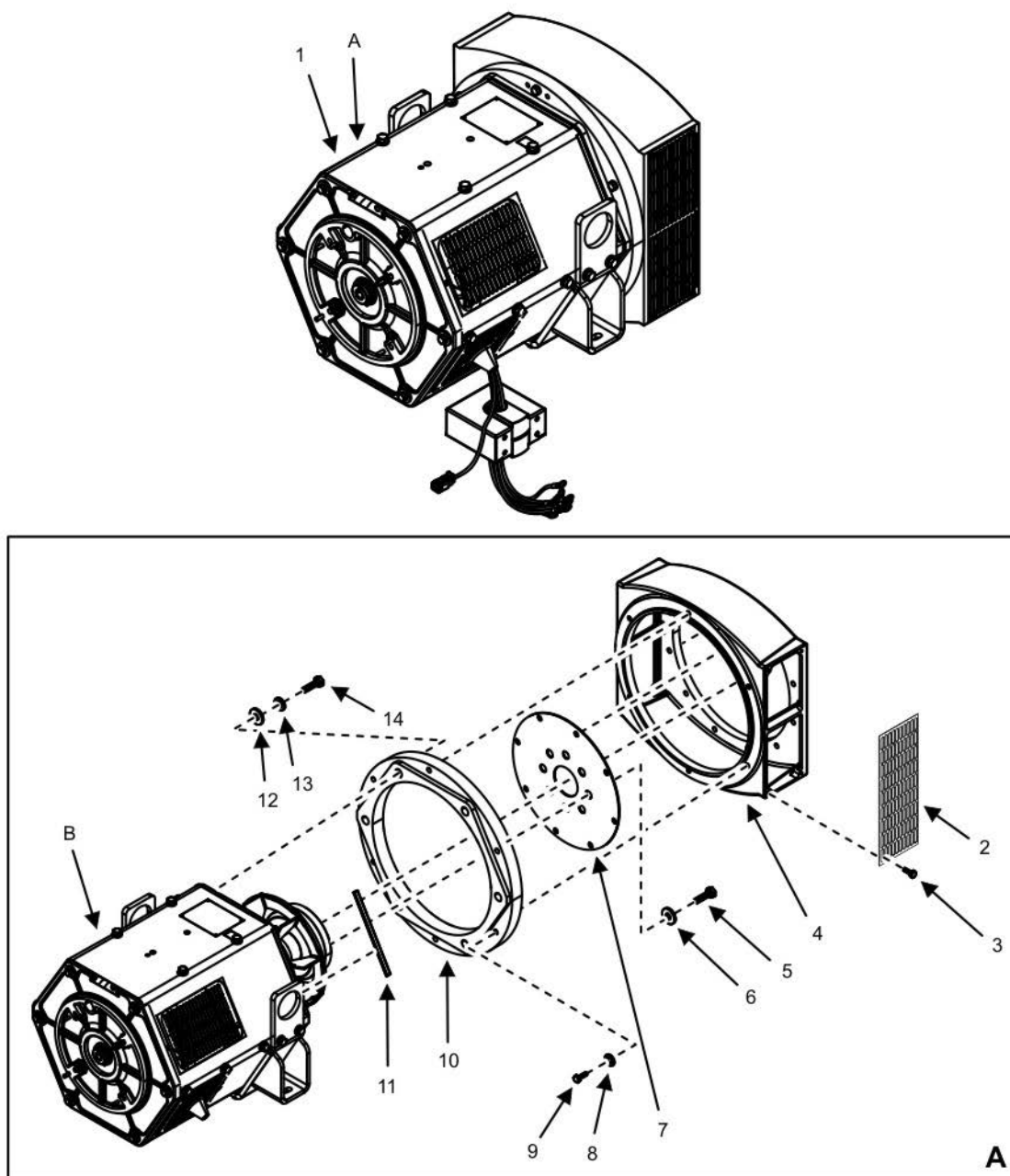


Figure 24. AC Generator Assembly, 50/60 Hz (Sheet 1 of 5).

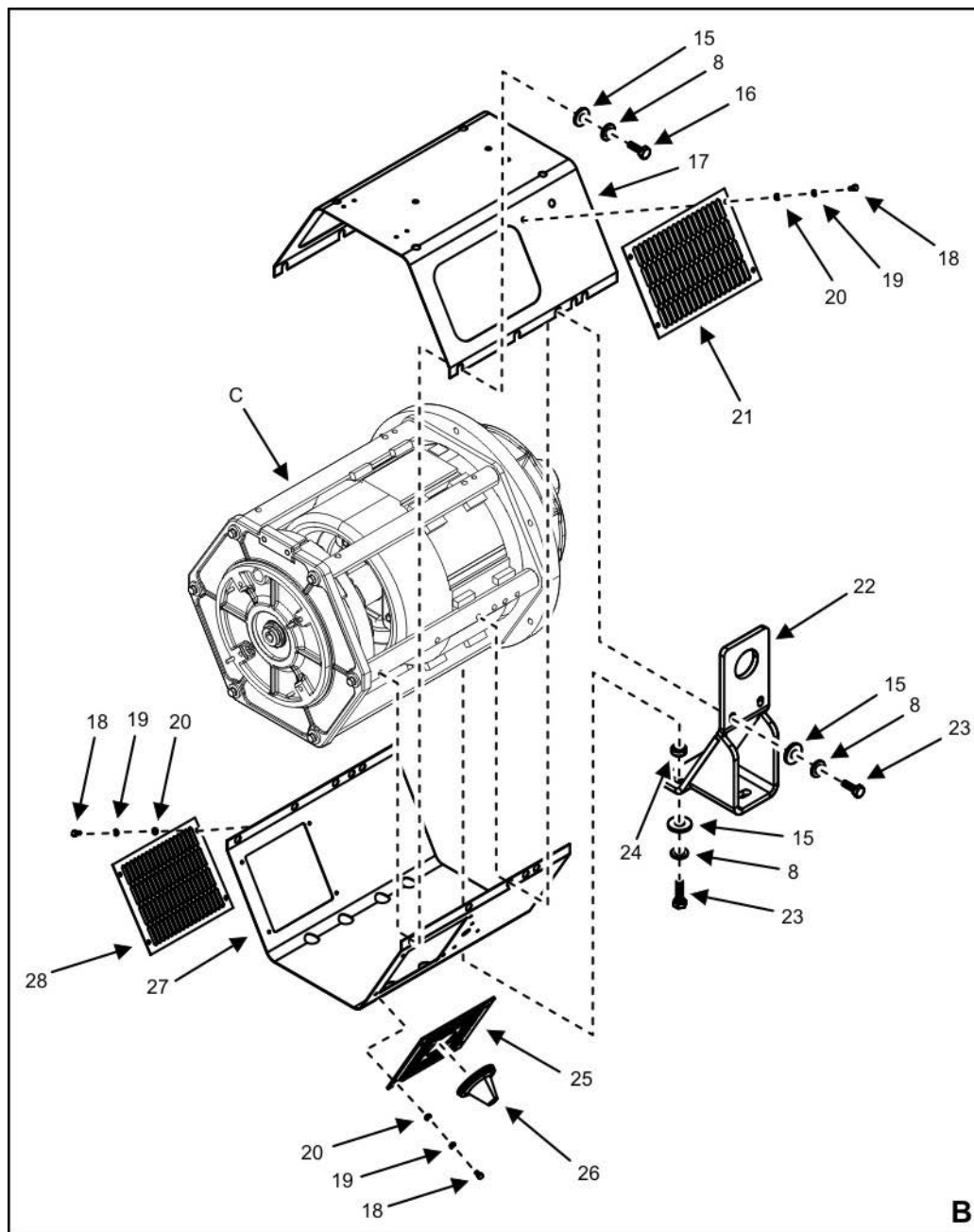


Figure 24. AC Generator Assembly, 50/60 Hz (Sheet 2 of 5).

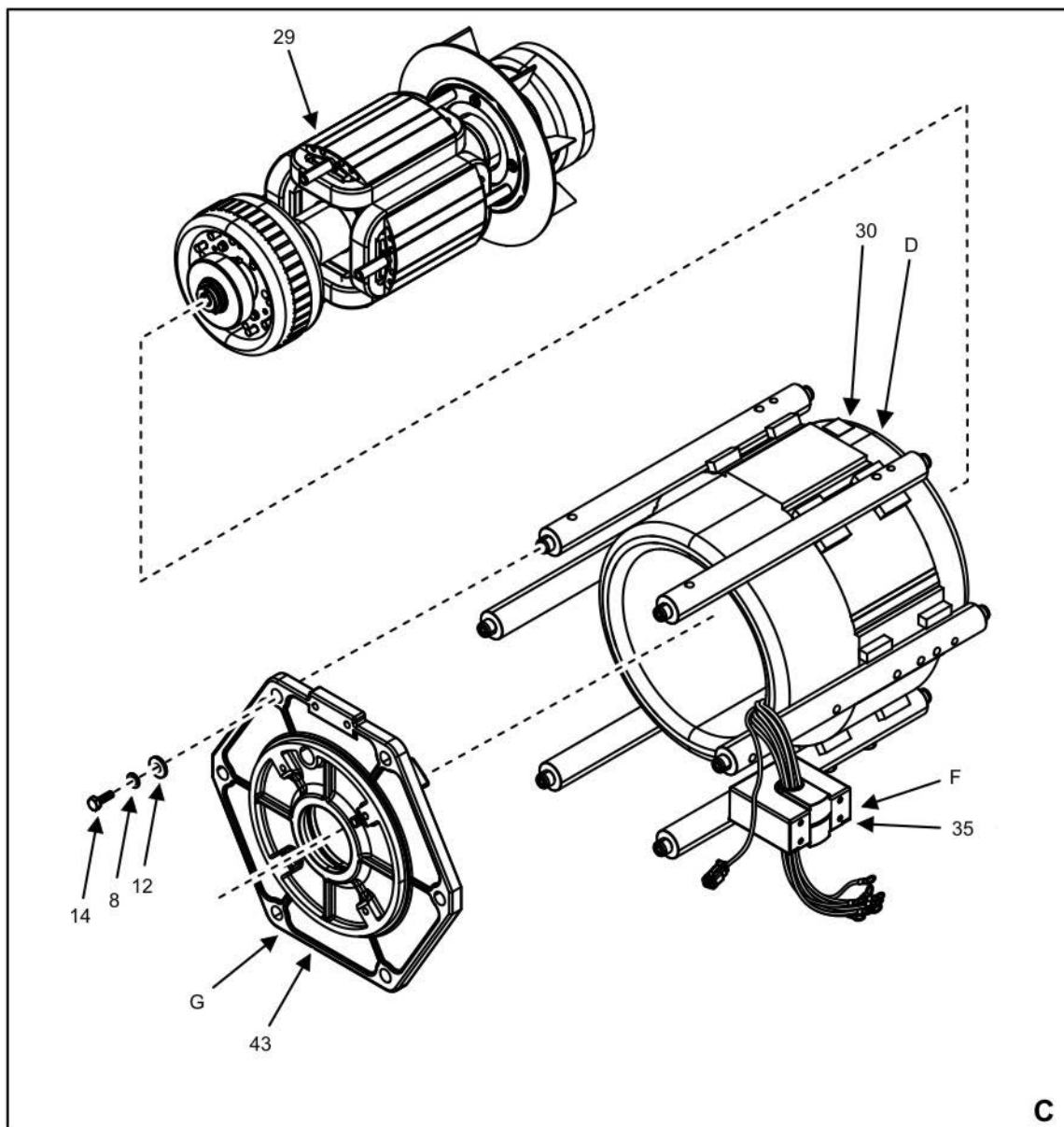


Figure 24. AC Generator Assembly, 50/60 Hz (Sheet 3 of 5).

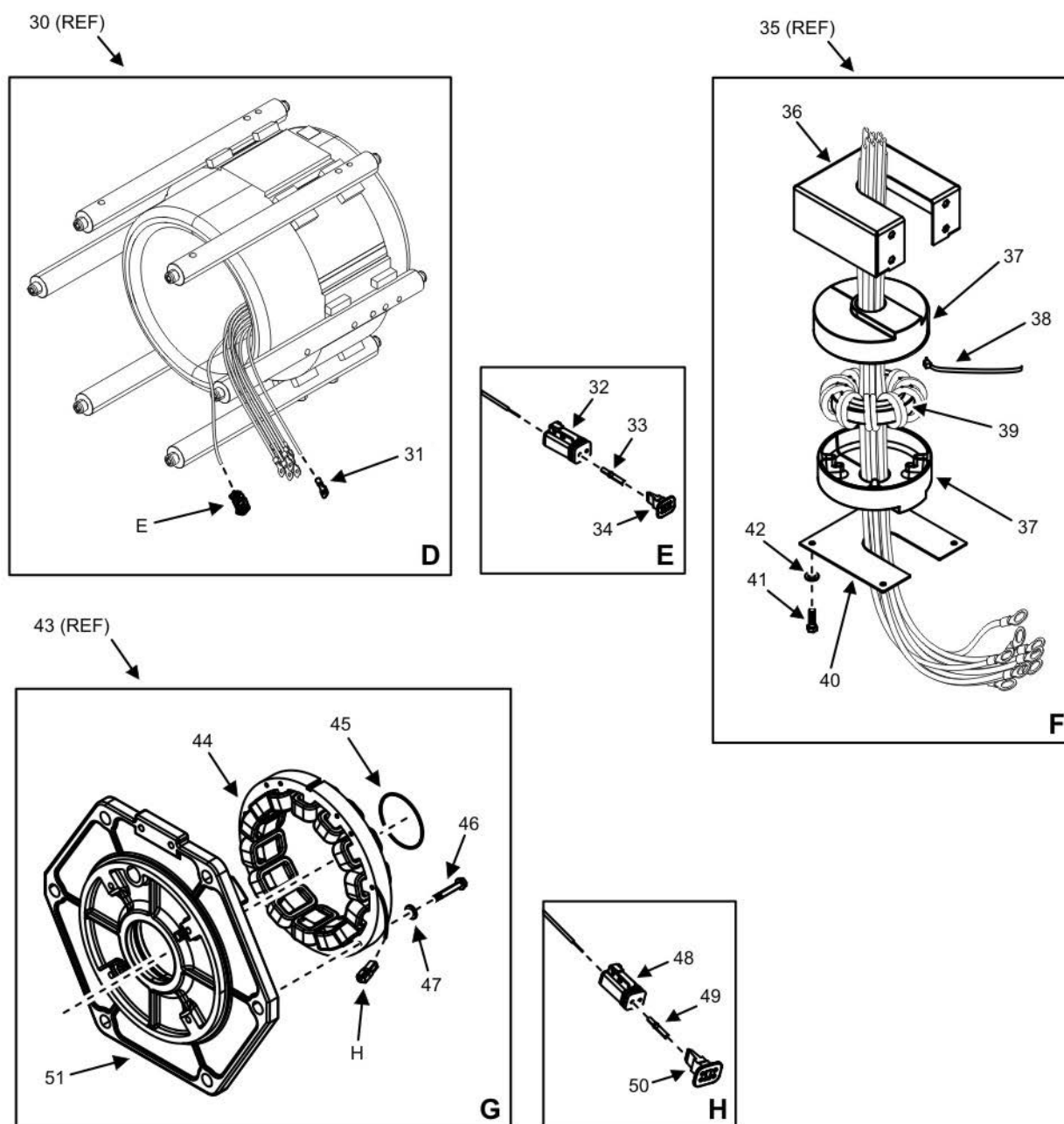


Figure 24. AC Generator Assembly, 50/60 Hz (Sheet 4 of 5).

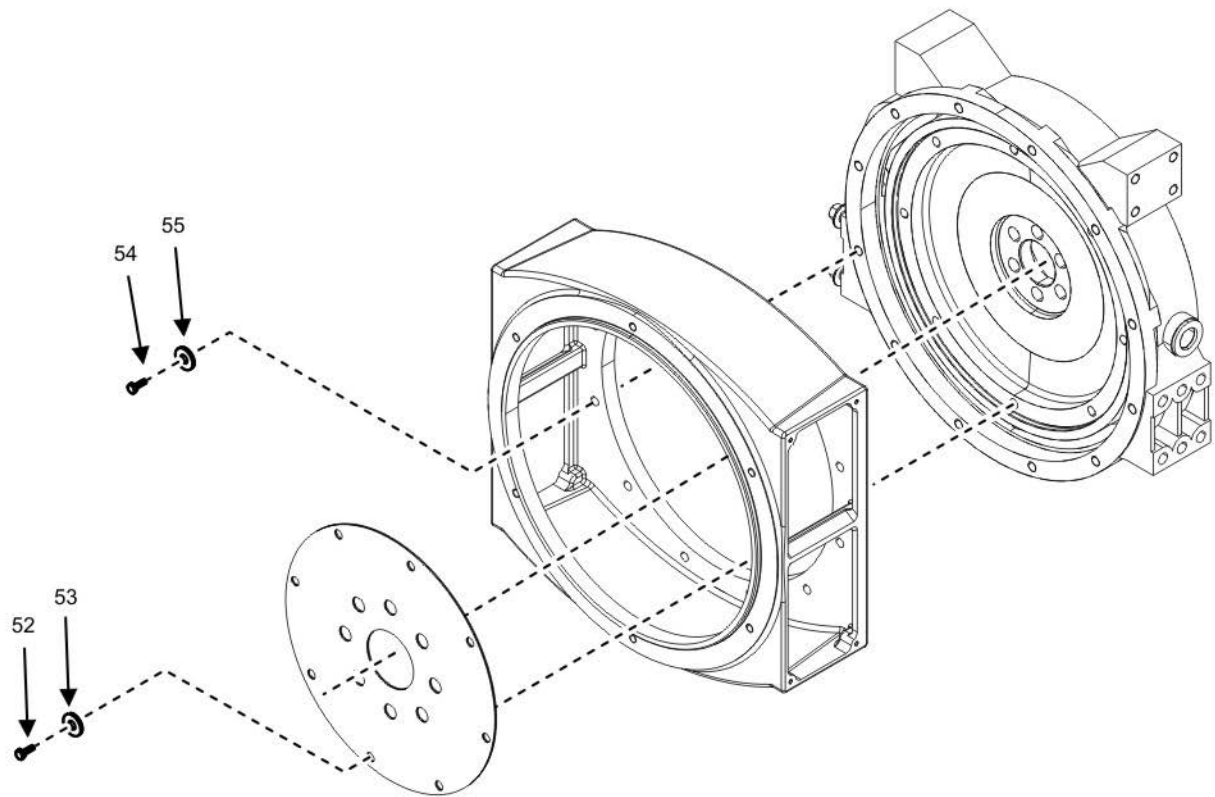


Figure 24. AC Generator Assembly, 50/60 Hz (Sheet 5 of 5).

(1)	(2)			(3)		(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 0901	
								FIG. 24 AC GENERATOR ASSEMBLY, 50/60 HZ	
1	PAFHH	PAFHH	PAFDD	PAFDD	6115015954216	44940	0200-3167-01	.GENERATOR ASSEMBLY, 30 KW, 50/60 HZ UOC: 98L	1
2	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	0234-0903	..GUARD, FAN UOC: 98L	2
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305014729826	44940	0821-6001-01	..SCREW UOC: 98L	8
4	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	231-0329	..ADAPTER, GENERATOR UOC: 98L	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015955409	44940	720-1119	..SCREW, HEXAGON HEAD UOC: 98L	8
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015915002	44940	0526-0259	..WASHER, FLAT UOC: 98L	8
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6115015970915	44940	232-3698	..DISC, GENERATOR DRIVE UOC: 98L	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015957022	44940	0850-0114-55	..WASHER, LOCK UOC: 98L	28
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015963571	44940	800-3017-41	..SCREW, HEXAGON HEAD UOC: 98L	6
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	0231-0318	..RING, RETAINING UOC: 98L	1
11	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5330014566359	44940	0508-0139	..SEAL, PLAIN UOC: 98L	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015967544	44940	0232-3441	..WASHER, FLAT UOC: 98L	18
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014773397	44940	0850-0114-54	..WASHER, LOCK UOC: 98L	18
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305014773485	44940	0800-3017-20	..SCREW, HEXAGON HEAD UOC: 98L	18
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014773500	44940	0526-0399-62	..WASHER, FLAT UOC: 98L	8
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305014773499	44940	0800-0317-37	..SCREW, HEXAGON HEAD UOC: 98L	8
17	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	A029F701	..COVER, STATOR, UPPER UOC: 98L	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	A005Y870	..SCREW, HEX HEAD UOC: 98L	16
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	A007L363	..WASHER, LOCK UOC: 98L	16
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	A007L160	..WASHER, FLAT UOC: 98L	16
21	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53YZ8	A034G137	..SCREEN, GUARD UOC: 98L	2
22	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	A004T342	..MOUNTING FOOT UOC: 98L	2



(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5306014773519	44940	0800-3017-39	..SCREW, HEXAGON HEAD UOC: 98L	16
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5365014775088	44940	0232-3730-03	..SPACER, RING UOC: 98L	16
25	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53YZ8	A030Z836	..SCREEN, GUARD UOC: 98L	1
26	PCFZZ	PCFZZ	PCFZZ	PCFZZ		53YZ8	A003C918	..GROMMET UOC: 98L	1
27	XBFFF	XBFFF	XBFFF	XBFFF		53YZ8	A034G864	..COVER, STATOR, LOWER UOC: 98L	1
28	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53YZ8	A005X534	..SCREEN, AIR INLET UOC: 98L	1
29	XBFHH	XBFHH	XBFD	XBFD		44940	A026L688	..ROTOR, GENERATOR UOC: 98L (SEE FIGURE 25 FOR PARTS BREAKDOWN)	1
30	XBFHH	XBFHH	XBFD	XBFD		44940	A026K584	..STATOR, GENERATOR UOC: 98L	1
31	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	0332-3831-01	...TERMINAL RING UOC: 98L	10
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014475814	11139	DT06-2S	...CONNECTOR BODY, PLUG, ELECTRICAL UOC: 98L	1
33	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012036687	11139	0462-201-16141	...CONTACT, ELECTRICAL UOC: 98L	1
34	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014468180	11139	W2S	... CONNECTOR BODY, PLUG, ELECTRICAL UOC: 98L	1
35	PAFFF	PAFFF	PAFFF	PAFFF		53YZ8	A035J009	..FILTER, EMI UOC: 98L	1
36	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	A034P849	...BOX, POTTING UOC: 98L	1
37	PCFZZ	PCFZZ	PCFZZ	PCFZZ		53YZ8	A034R862	...ISOLATOR UOC: 98L	2
38	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	A007A677	...CABLE, TIE UOC: 98L	2
39	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	A034P825	...FILTER, FERRITE UOC: 98L	1
40	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	A034S429	...COVER, BOX UOC: 98L	1
41	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	A025H476	...SCREW, HEXAGON HEAD UOC: 98L	4
42	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	A007L156	...WASHER, FLAT UOC: 98L	4
43	PAFFF	PAFFF	PAFFF	PAFFF	4320015973680	44940	A026L569	..ENDBELL ASSEMBLY UOC: 98L	1
44	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	A026H036	...STATOR, EXCITER UOC: 98L	1
45	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44940	0509-0266-02	...O-RING UOC: 98L	1

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
46	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305014773402	44940	0800-2042	...SCREW, HEXAGON HEAD UOC: 98L	4
47	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310013267487	44940	0850-2006	...WASHER, LOCK UOC: 98L	4
48	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015065555	11139	DT04-2P	...CONNECTOR, RECEPTACLE UOC: 98L	1
49	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012163648	11139	0460-202-16141	...CONTACT, ELECTRICAL UOC: 98L	1
50	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015191808	11139	W2P	...RETAINER, ELECTRICAL CONNECTOR UOC: 98L	1
51	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	A026H878	...ENDBELL UOC: 98L	1
52	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015960483	05047	AES07M10C020CG7JH1	...SCREW, CAP, HEXAGON HEAD UOC: 98L	8
53	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015963757	05047	AEW24X37N062BD6FY1	.WASHER, FLAT UOC: 98L	8
54	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015960494	05047	AES07M10C030CG2K41	.SCREW, HEXAGON HEAD UOC: 98L	12
55	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN126-M10	.WASHER, FLAT UOC: 98L	12
END OF FIGURE									

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**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**ROTOR ASSEMBLY, 50/60 HZ REPAIR PARTS LIST**

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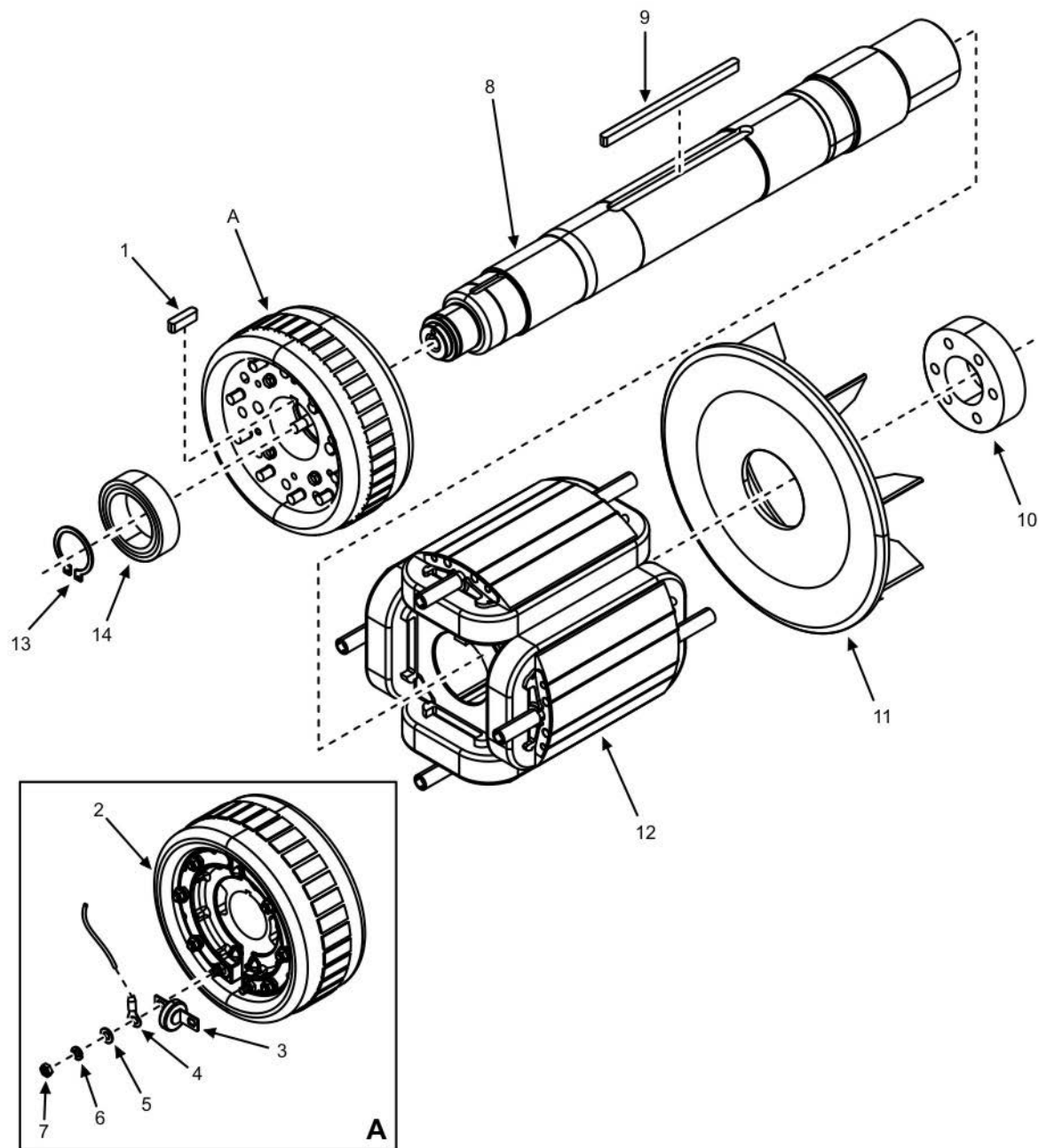
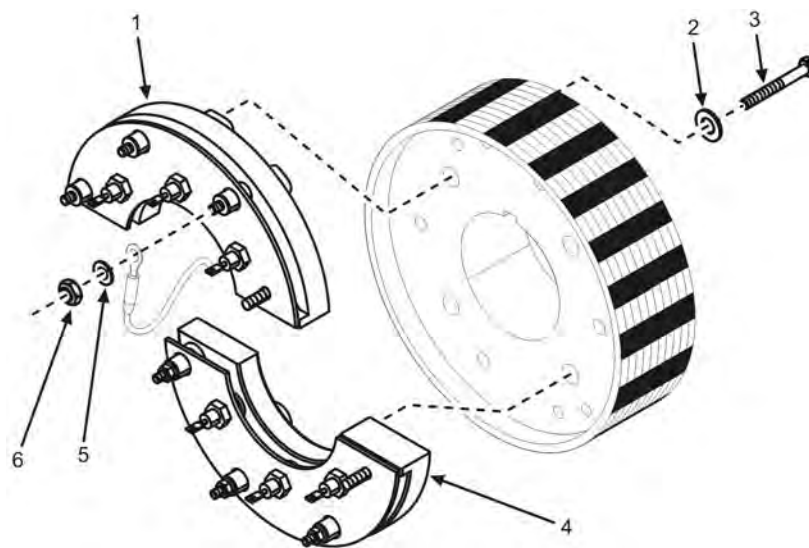


Figure 25. Rotor Assembly, 50/60 Hz.

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090101	
								FIG. 25 ROTOR ASSEMBLY, 50/60 HZ	
1	XBFZZ	XBFZZ	XBFZZ	XBFZZ	5315015967783	44940	0515-0298-01	.KEY, MACHINED, EXCITER UOC: 98L	1
2	XAFFF	XAFFF	XAFFF	XAFFF	6105015973426	44940	0201-3434-01	.ROTOR ASSEMBLY, WOUND, EXCITER UOC: 98L (SEE FIGURE 26 FOR PARTS BREAKDOWN)	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5905013291699	44940	0304-0807	.VARISTOR ASSEMBLY UOC: 98L	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015938312	44940	0332-2980-05	.TERMINAL, RING UOC: 98L	2
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014773448	44940	0526-2060	.WASHER, FLAT UOC: 98L	2
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310013213478	44940	0850-2005	.WASHER, LOCK UOC: 98L	2
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014730397	44940	0860-2006	.NUT, HEXAGON UOC: 98L	2
8	XAFZZ	XAFZZ	XAFZZ	XAFZZ		53YZB	A035B152	.SHAFT, ROTOR UOC: 98L	1
9	XAFZZ	XAFZZ	XAFZZ	XAFZZ		44940	0515-0299-02	.KEY, MACHINED UOC: 98L	1
10	XAFZZ	XAFZZ	XAFZZ	XAFZZ		53YZB	A035B156	.HUB, GENERATOR DRIVE UOC: 98L	1
11	XAFZZ	XAFZZ	XAFZZ	XAFZZ		44940	A026K415	.FAN, GENERATOR UOC: 98L	1
12	XAFZZ	XAFZZ	XAFZZ	XAFZZ		44940	0201-3472-02	.ROTOR, ASSEMBLY, WOUND UOC: 98L	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4810015976397	44940	0518-0122	.RING UOC: 98L	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3110015970652	44940	A026K421	.BEARING, BALL UOC: 98L	1
								END OF FIGURE	



**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**RECTIFIER ASSEMBLY, 50/60 HZ REPAIR PARTS LIST**



**Figure 26. Rectifier Assembly, 50/60 Hz.**

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 09010101	
								FIG. 26 RECTIFIER ASSEMBLY, 50/60 HZ	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5961015893954	44940	357-0091	.RECTIFIER ASSEMBLY, FORWARD UOC: 98L	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310013267487	44940	850-2006	.WASHER, LOCK UOC: 98L	4
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015964641	44940	800-2040	.SCREW UOC: 98L	4
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6130014493311	44940	357-0092	.RECTIFIER ASSEMBLY, REVERSE UOC: 98L	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015140168	44940	526-2050	.WASHER, FLAT UOC: 98L	6
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310014773488	44940	0870-2064-01	.NUT, LOCK UOC: 98L	6
								<b>END OF FIGURE</b>	





FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
AC GENERATOR ASSEMBLY, 400 HZ REPAIR PARTS LIST

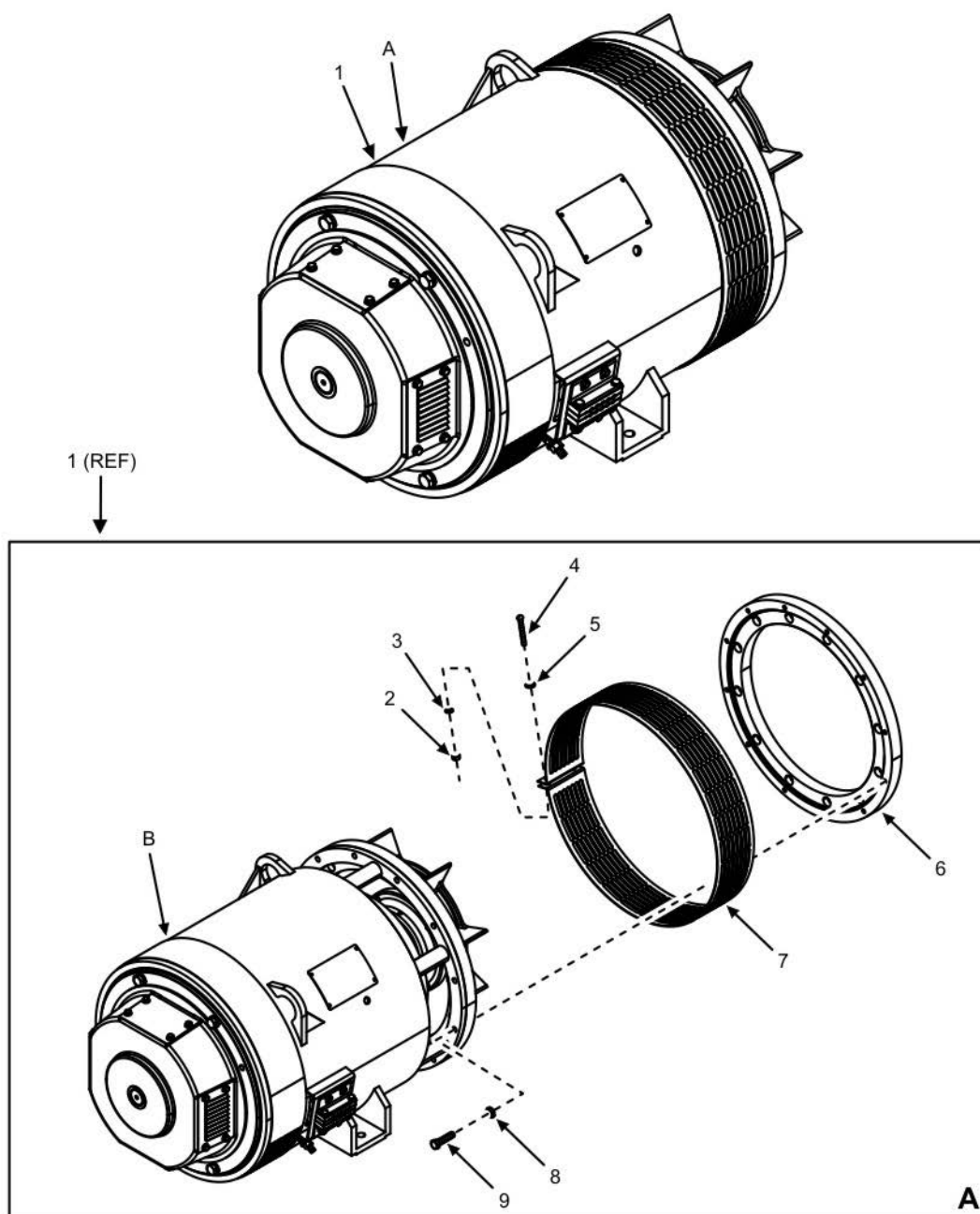


Figure 27. AC Generator Assembly, 400 Hz (Sheet 1 of 3).

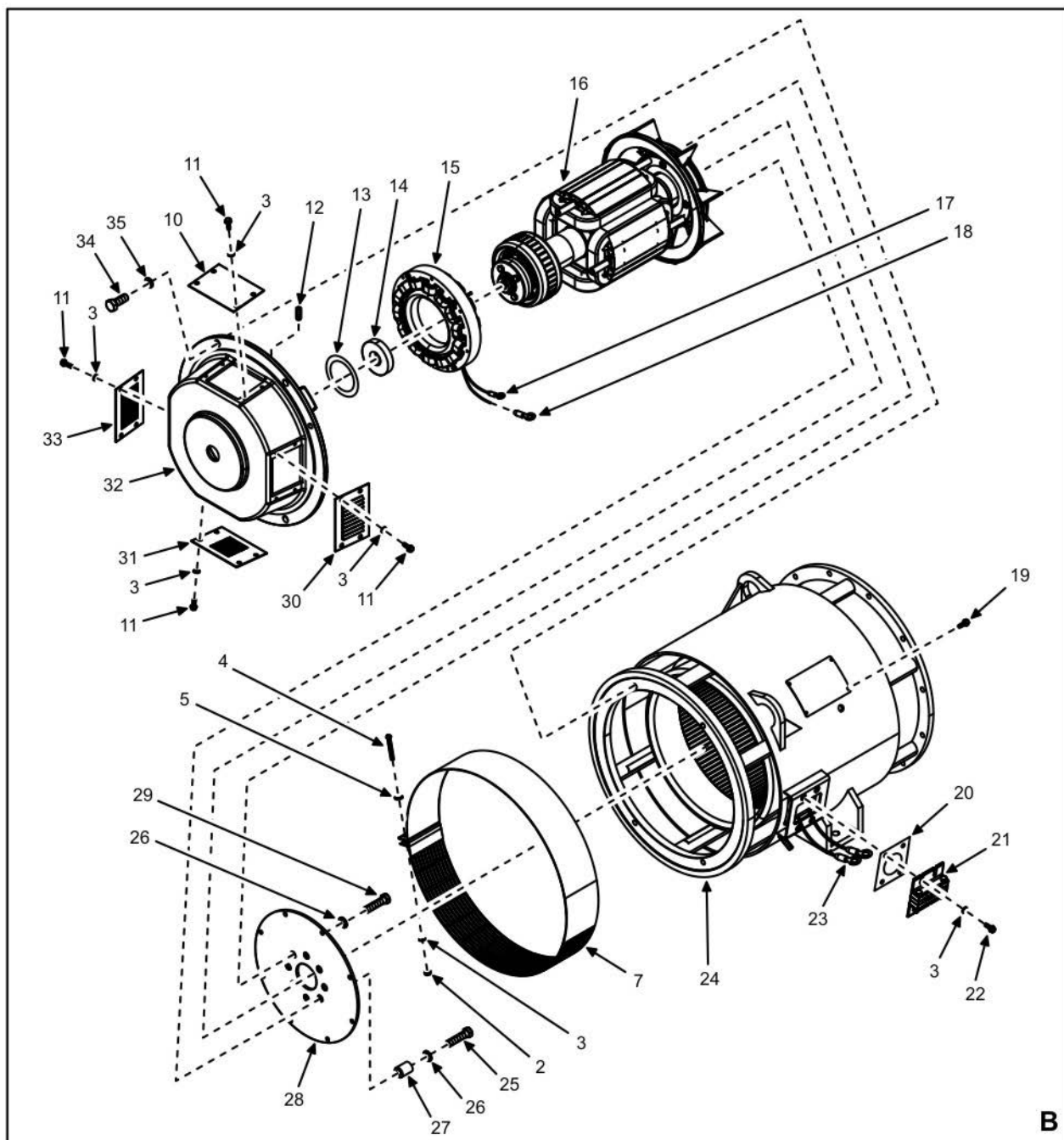


Figure 27. AC Generator Assembly, 400 Hz (Sheet 2 of 3).

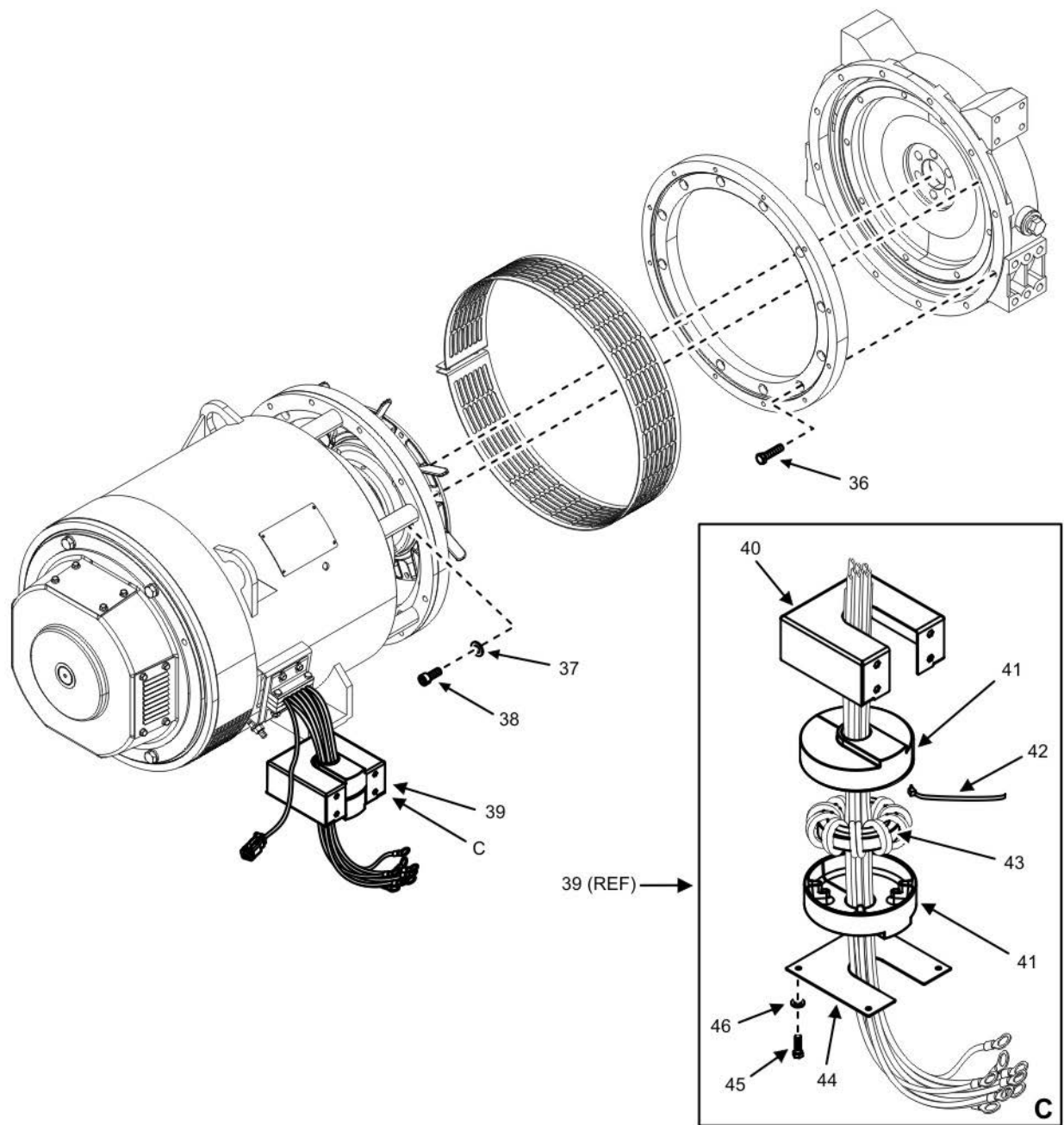


Figure 27. AC Generator Assembly, 400 Hz (Sheet 3 of 3).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0901	
								FIG. 27 AC GENERATOR ASSEMBLY, 400 HZ	
1	PAFHH	PAFHH	PAFDD	PAFDD		38151	3493-1466	..GENERATOR ASSEMBLY, 30 KW, 400 HZ UOC: 98M	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310007616882	96906	MS51967-2	..NUT, PLAIN, HEXAGON UOC: 98M	4
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310005825965	80205	MS35338-44	..WASHER, LOCK UOC: 98M	24
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305009881728	80205	MS35206-287	..SCREW, MACHINE UOC: 98M	4
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310013331883	96906	MS27183-49	..WASHER, FLAT UOC: 98M	5
6	XBFZZ	XBFZZ	XBFZZ	XBFZZ		38151	71514-01	..RING, ADAPTER UOC: 98M	1
7	XBFZZ	XBFZZ	XBFZZ	XBFZZ		36156	720982-0A	..COVER, BAND UOC: 98M	2
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	801065-07	..WASHER, LOCK UOC: 98M	12
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	801004-07	..SCREW, CAP, HEXAGON HEAD UOC: 98M	12
10	XBFZZ	XBFZZ	XBFZZ	XBFZZ		36156	718514-01	..COVER, TOP UOC: 98M	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305000680500	11599	28988-4	..SCREW, CAP, HEXAGON HEAD UOC: 98M	16
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015332163	36156	801048-04	..SCREW, SET UOC: 98M	8
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5331013697318	36156	865873-01	..O-RING UOC: 98M	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3110001556298	58536	A-A-59585-21JCBE	..BEARING, BALL, ANNULAR UOC: 98M	1
15	XBFZZ	XBFZZ	XBFZZ	XBFZZ		36156	778718-0A	..STATOR, GENERATOR UOC: 98M	1
16	XBFHH	XBFHH	XBFD	XBFD		36156	777116-0A	..ROTOR ASSEMBLY UOC: 98M (SEE FIGURE 28 FOR PARTS BREAKDOWN)	1
17	MFFZZ	MFFZZ	MFFZZ	MFFZZ		30554	88-21007-36	..INSULATION, SLEEVEING (MAKE FROM M3190/3-17-0 ON BULK ITEMS LIST) UOC: 98M	2
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001130954	381343	MS20659-165	..TERMINAL, LUG UOC: 98M	2
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305002535615	80205	MS21318-21	..SCREW, DRIVE UOC: 98M	4
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ		36156	834822-01	..GASKET, LEAD CLAMP UOC: 98M	1

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
21	XBFZZ	XBFZZ	XBFZZ	XBFZZ		36156	116563-01	..LEAD CLAMP ASSEMBLY UOC: 98M	1
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305000680502	80205	MS90725-6	..SCREW, CAP, HEXAGON HEAD UOC: 98M	4
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001141314	81343	MS20659-129	..TERMINAL, LUG UOC: 98M	1
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ		36156	752826-0A	..FRAME, STATOR ASSEMBLY UOC: 98M	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305002693241	80204	B1821BH038F175N	..SCREW, CAP, HEXAGON HEAD UOC: 98M	2
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310000877493	96906	MS27183-13	..WASHER, FLAT UOC: 98M	8
27	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	88-22205	..SPACER, COUPLER UOC: 98M	2
28	XBFZZ	XBFZZ	XBFZZ	XBFZZ		36156	702807-01	..DISC, COUPLING UOC: 98M	2
29	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305002692803	80205	MS90726-60	..SCREW, CAP, HEXAGON HEAD UOC: 98M	6
30	XBFZZ	XBFZZ	XBFZZ	XBFZZ		36156	718515-01	..COVER, LOUVERED, RS UOC: 98M	1
31	XBFZZ	XBFZZ	XBFZZ	XBFZZ		36156	718517-01	..COVER, LOUVERED, BO UOC: 98M	1
32	XBFZZ	XBFZZ	XBFZZ	XBFZZ		36156	130119-01	..END BELL UOC: 98M	1
33	XBFZZ	XBFZZ	XBFZZ	XBFZZ		36156	718516-01	..COVER, LOUVERED, LS UOC: 98M	1
34	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305012838664	80205	MS90725-110	..SCREW, CAP, HEXAGON UOC: 98M	4
35	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310000034094	96906	MS35338-48	..WASHER, LOCK UOC: 98M	4
36	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN912-M10X25	..SCREW, CAP, SOCKET HEAD UOC: 98M	12
37	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015963757	05047	AEW24X37N062BD6FY1	..WASHER, FLAT UOC: 98M	8
38	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015960483	05047	AES07M10C020CG7J H1	..SCREW, CAP, HEXAGON HEAD UOC: 98M	8
39	PAFFF	PAFFF	PAFFF	PAFFF		53YZ8	A035J009	..FILTER, EMI UOC: 98M	1
40	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	A034P849	..BOX, POTTING UOC: 98M	1
41	PCFZZ	PCFZZ	PCFZZ	PCFZZ		53YZ8	A034R862	..ISOLATOR UOC: 98M	2
42	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	A007A677	..CABLE, TIE UOC: 98M	2
43	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	A034P825	..FILTER, FERRITE UOC: 98M	1
44	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	A034S429	..COVER, BOX UOC: 98M	1
45	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	A025H476	..SCREW, HEXAGON HEAD UOC: 98M	4

(1)	(2)				(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR AIR FORCE	CODE USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
46	PAFZZ	PAFZZ	PAFZZ	PAFZZ		53YZ8	A007L156		..WASHER, FLAT UOC: 98M	4
END OF FIGURE										

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**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
ROTOR ASSEMBLY, 400 HZ REPAIR PARTS LIST**

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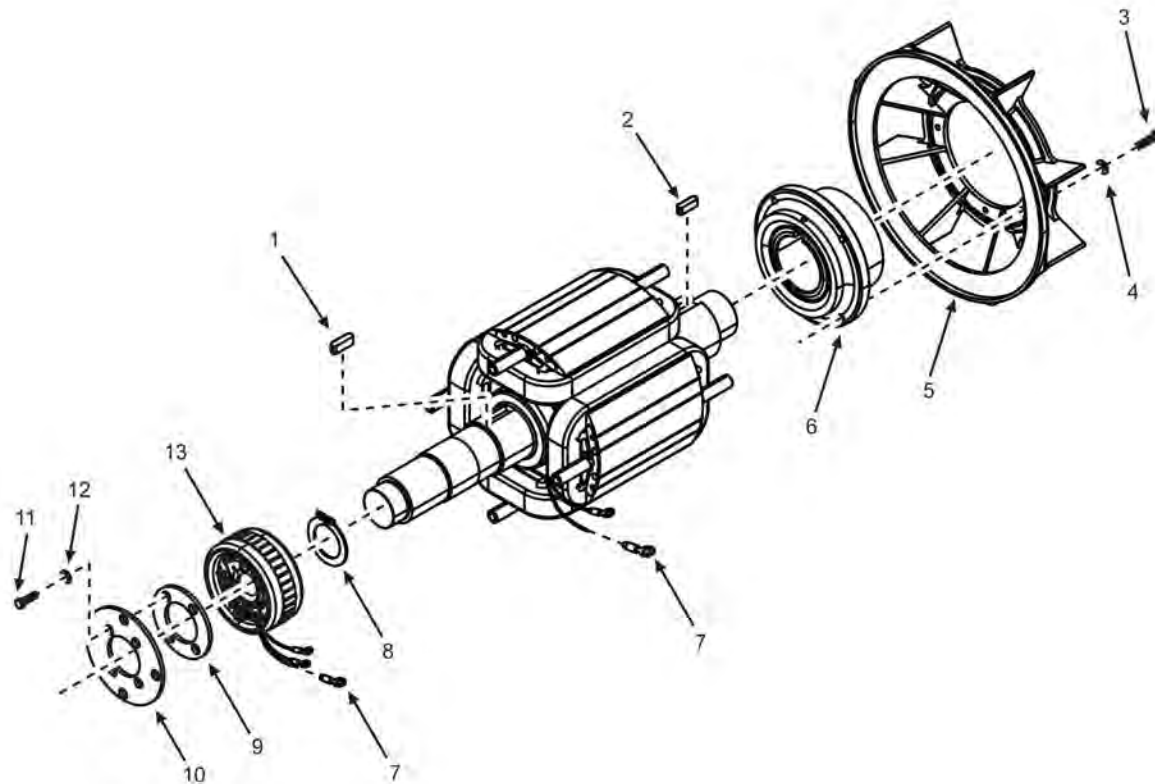


Figure 28. Rotor Assembly, 400 Hz.



(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090101	
								FIG. 28 ROTOR ASSEMBLY, 400 HZ	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5315008473531	96906	MS20066-356	.KEY, MACHINE UOC: 98M	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5315012229228	96906	MS20066-358	.KEY, MACHINE UOC: 98M	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305000680511	80204	B1821BH038C125N	.SCREW, CAP, HEXAGON HEAD UOC: 98M	4
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310006379541	0W357	4700-4	.WASHER, LOCK UOC: 98M	4
5	XBFZZ	XBFZZ	XBFZZ	XBFZZ		36156	716511-02	.FAN UOC: 98M	1
6	XBHZZ	XBHZZ	XBFZZ	XBFZZ		36156	707509-01	.HUB, DRIVE UOC: 98M	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001434777	81343	MS25036-157	.TERMINAL, LUG UOC: 98M	5
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5325015332174	36156	832805-01	.RING, RETAINING UOC: 98M	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6130015332167	36156	707807-02	.RECTIFIER, METALLIC UOC: 98M	1
10	PAFFF	PAFFF	PAFFF	PAFFF	2920012986321	36156	777056-0A	.RECTIFIER ASSEMBLY UOC: 98M (SEE FIGURE 29 FOR PARTS BREAKDOWN)	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305000680501	80205	MS90725-5	.SCREW, CAP, HEXAGON HEAD UOC: 98M	4
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310005501130	80205	MS35333-40	.WASHER, LOCK UOC: 98M	4
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6115015332172	30554	791150-0A	.EXCITER, ARMATURE UOC: 98M	1
								<b>END OF FIGURE</b>	



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**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
RECTIFIER ASSEMBLY, 400 HZ REPAIR PARTS LIST**

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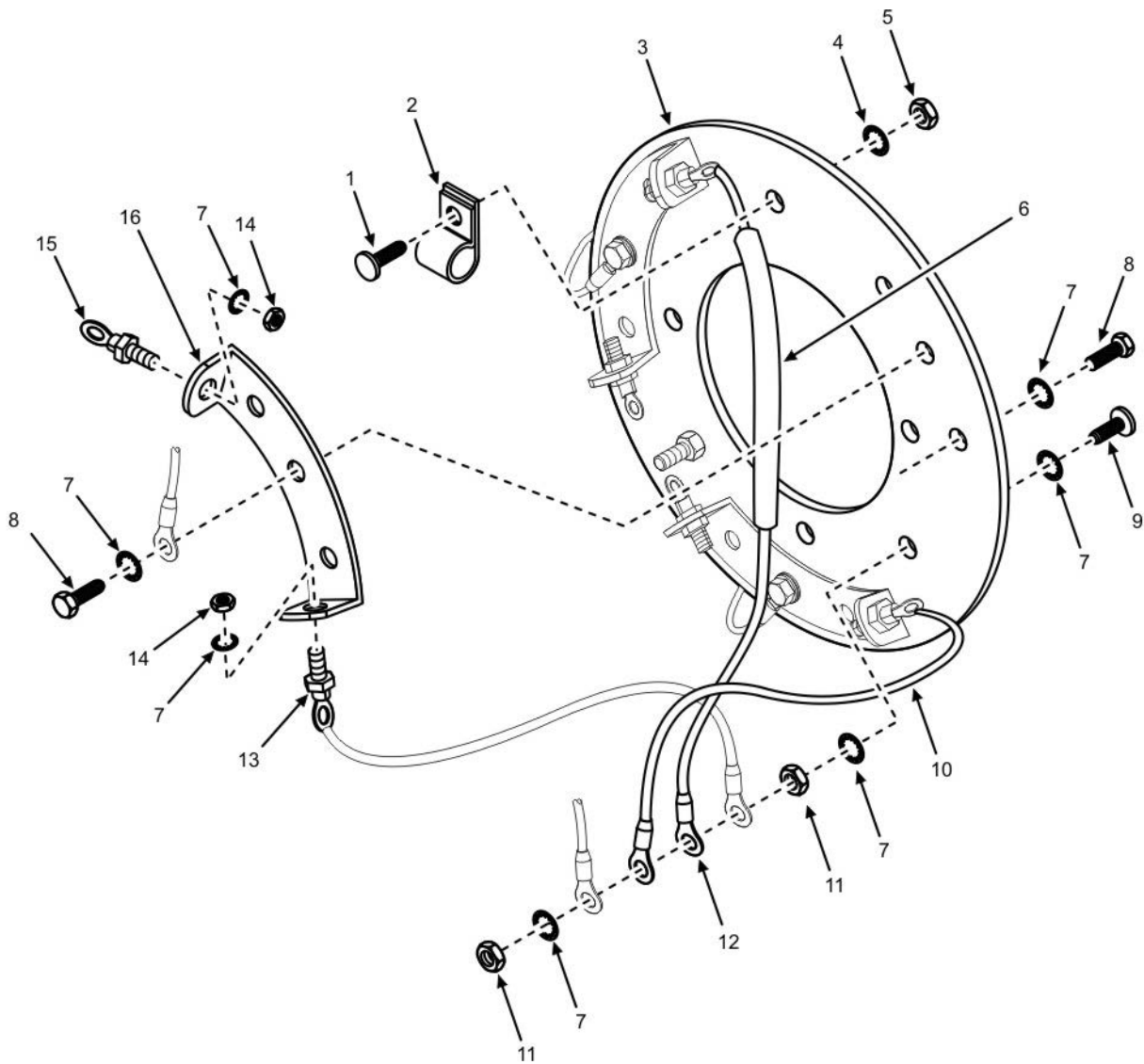
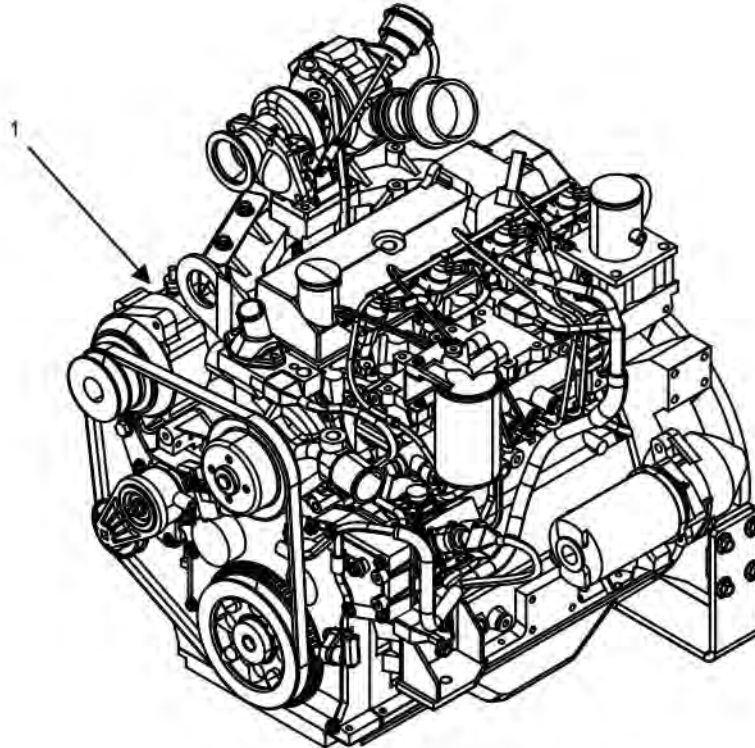


Figure 29. Rectifier Assembly, 400 Hz.

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 09010101	
								FIG. 29 RECTIFIER ASSEMBLY, 400 HZ	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305009846196	80063	MS35206-248	.SCREW, MACHINE UOC: 98M	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340013022960	96906	MS25281-4	.CLAMP, LOOP UOC: 98M	1
3	XBFZZ	XBFZZ	XBFZZ	XBFZZ		36156	B-718817-01	.PLATE, RECTIFIER UOC: 98M	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310005590070	80205	MS35333-38	.WASHER, LOCK UOC: 98M	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310009349757	80205	MS35649-282	.NUT, PLAIN, HEXAGON UOC: 98M	1
6	MFFZZ	MFFZZ	MFFZZ	MFFZZ		30554	88-21649-17	.INSULATION, SLEEVE (MAKE FROM M3190/3-17-0 ON BULK ITEMS LIST, CUT TO LENGTH AS REQUIRED) UOC: 98M	2
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310005501130	80205	MS35333-40	.WASHER, LOCK UOC: 98M	21
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305000680500	11599	28988-4	.SCREW, CAP, HEXAGON HEAD UOC: 98M	9
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305009881727	80205	MS35206-283	.SCREW, MACHINE UOC: 98M	2
10	MFFZZ	MFFZZ	MFFZZ	MFFZZ		30554	88-21649-19	.WIRE, ELECTRICAL (MAKE FROM 88- 20444-2 ON BULK ITEMS LIST, CUT TO LENGTH AS REQUIRED) UOC: 98M	6
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310007616882	96906	MS51967-2	. NUT, PLAIN, HEXAGON UOC: 98M	4
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940002300515	81343	MS25036-154	.TERMINAL LUG UOC: 98M	6
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5961001547046	81349	JANTX1N1190	.SEMICONDUCTOR DEVICE UOC: 98M	3
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310001671344	80205	AN315-4R	. NUT, PLAIN, HEXAGON UOC: 98M	6
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5961010679493	81349	JANTX1N1190R	.SEMICONDUCTOR DEVICE UOC: 98M	3
16	XBFZZ	XBFZZ	XBFZZ	XBFZZ		36156	B718930-01	.PLATE, RECTIFIER UOC: 98M	3
								END OF FIGURE	



**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
ENGINE ASSEMBLY REPAIR PARTS LIST**



**Figure 30. Engine Assembly.**

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 0902	
								FIG. 30 ENGINE ASSEMBLY	
1	PAFHH	PAFHH	PAFDD	PAFDD	2815015967562	44940	04-20160	.ENGINE ASSEMBLY	1
								END OF FIGURE	





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**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
LUBRICATION SYSTEM REPAIR PARTS LIST**

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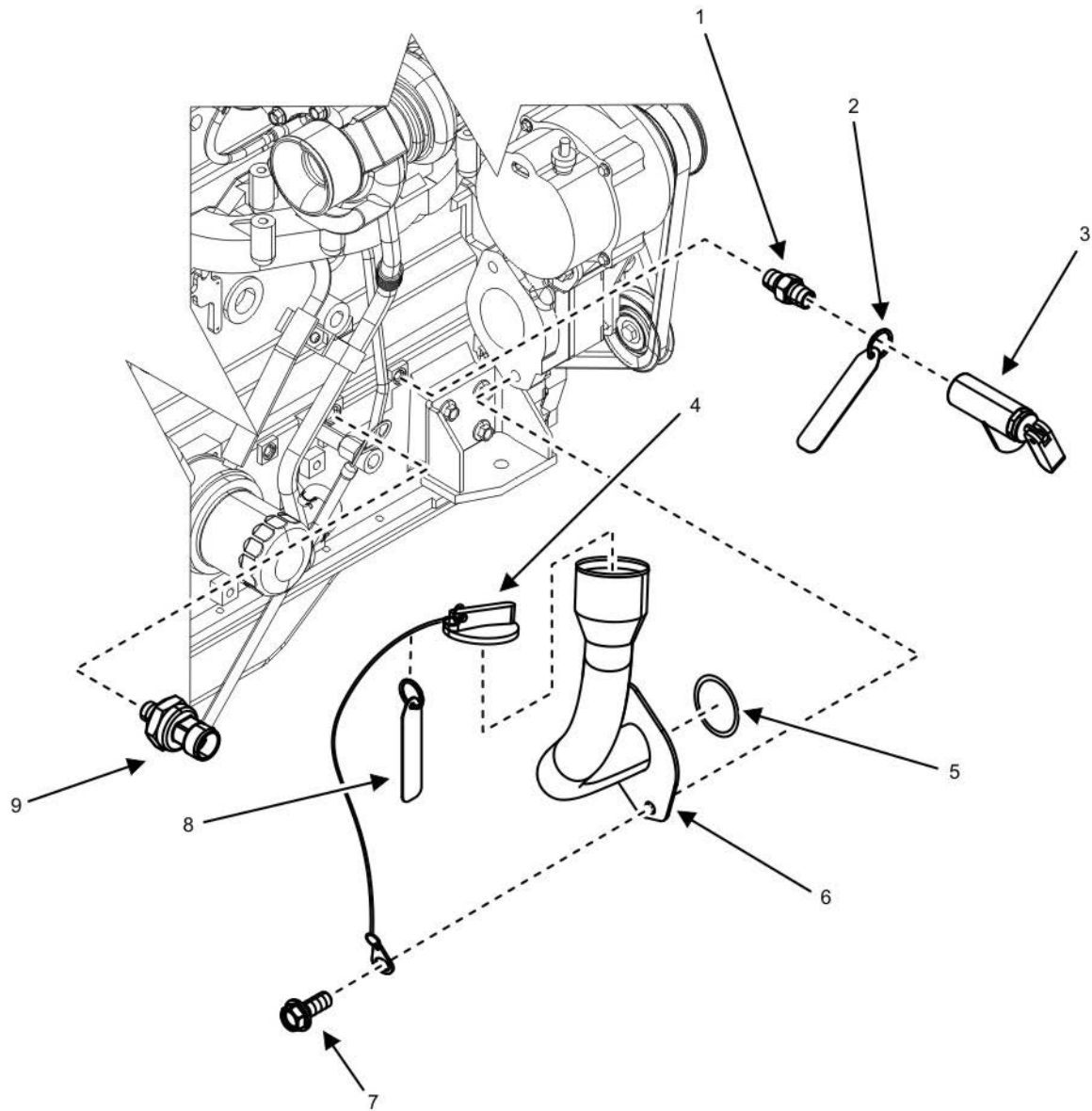


Figure 31. Lubrication System.

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090201	
								FIG. 31 LUBRICATION SYSTEM	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730010554021	07421	425-100-004	.ADAPTER, STRAIGHT (1/8 INCH NPT)	1
2	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21597	.LABEL, INFORMATION	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4820013671836	70411	SP2529VT	.VALVE, OIL SAMPLING	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	04-21824	.CAP, FILLER	1
5	PCFZZ	PCFZZ	PCFZZ	PCFZZ		30554	C0700002085	.SEAL, O-RING,	1
6	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21823	.TUBE, OIL FILLER	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015100867	0B8S3	C0143501020	.SCREW, HEX FLANGE HEAD CAP	2
8	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21429	.PLATE, ENGINE OIL CHANGE	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6620015982271	22863	P4055-5001-1	.SENDER, OIL PRESSURE	1
								END OF FIGURE	



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**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
ENGINE OIL DRAIN HOSE ASSEMBLY REPAIR PARTS LIST**

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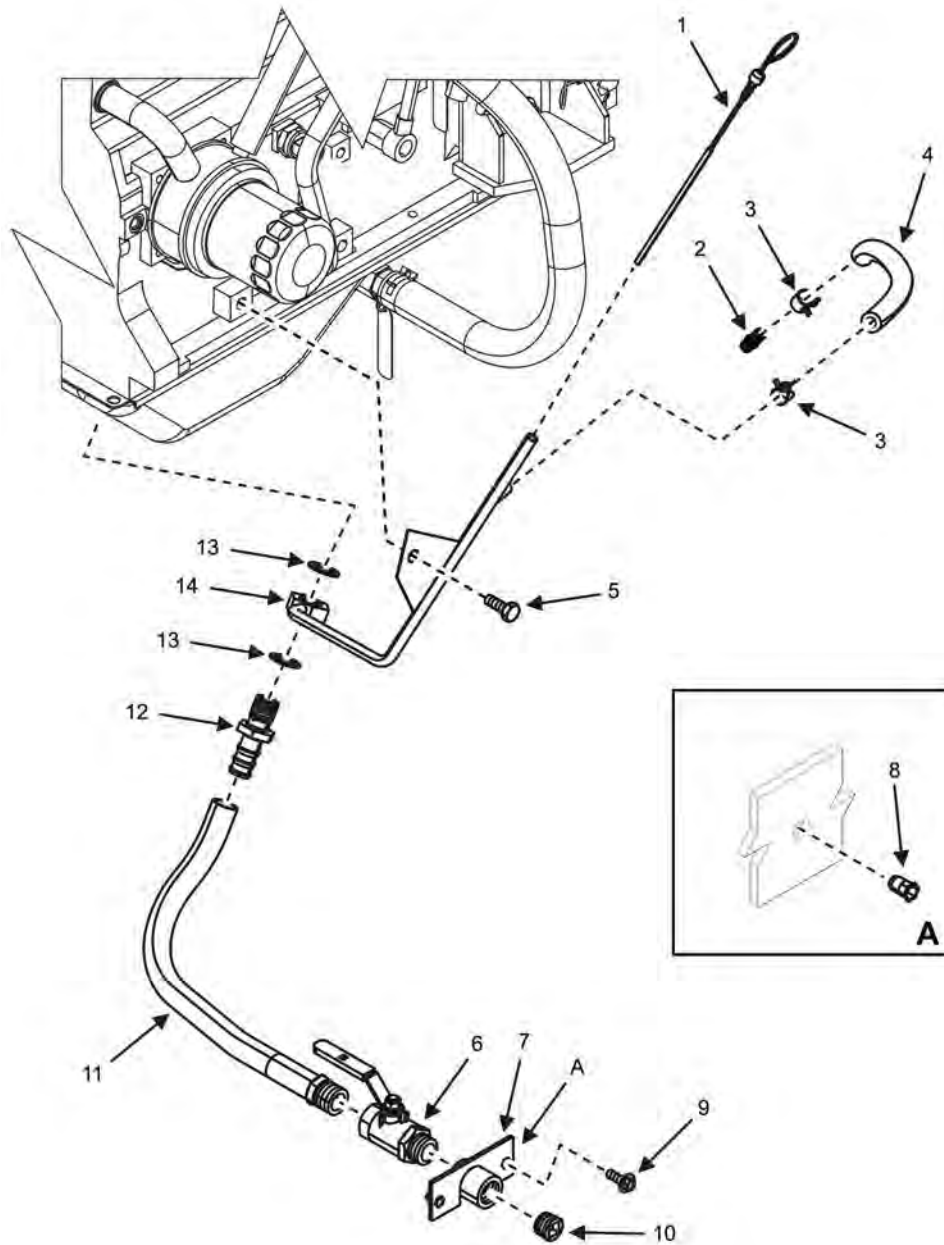


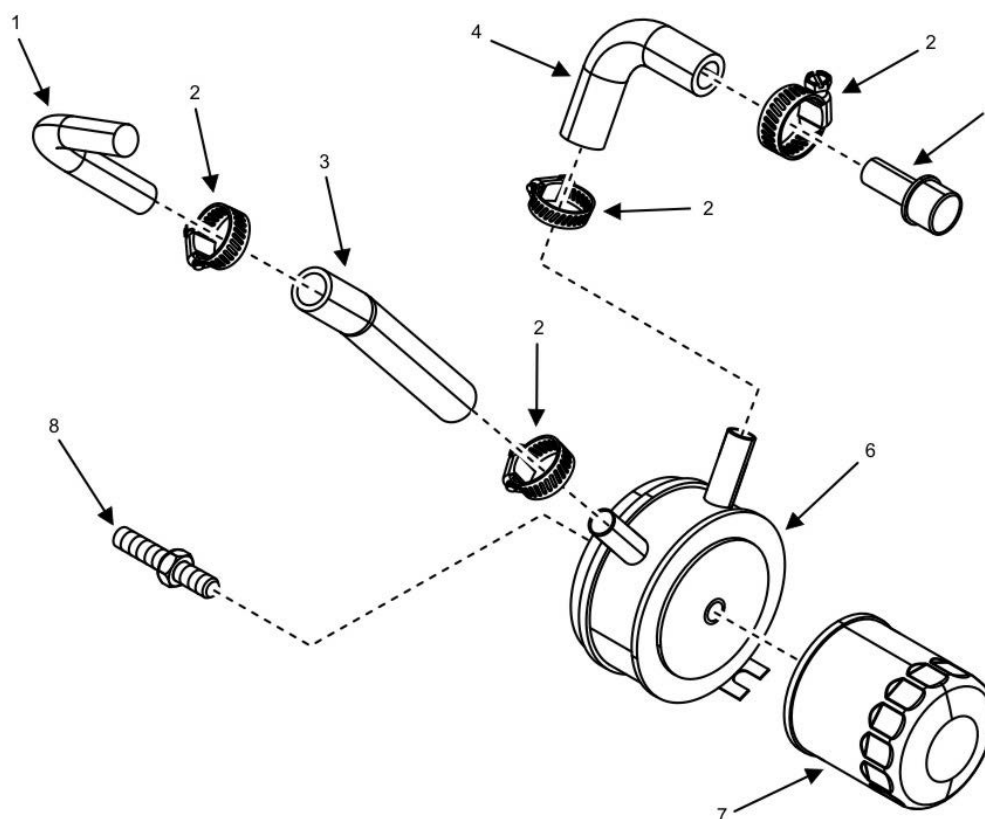
Figure 32. Engine Oil Drain Hose Assembly.

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090202	
								FIG. 32 ENGINE OIL DRAIN HOSE ASSEMBLY	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	04-21458	.DIPSTICK, ENGINE OIL	1
2	XBFZZ	XBFZZ	XBFZZ	XBFZZ		33457	SP101200JF	.FITTING, CONNECTOR	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015961298	44940	SAEJ1508CTB-16	.CLAMP, HOSE	2
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ			04-21510-5	.HOSE, OIL (3/8 INCH ID)	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015919022	44940	AES10M10C020WB4K42	SCREW, CAP, HEXAGON HEAD	1
6	XBFZZ	XBFZZ	XBFZZ	XBFZZ		93061	XV501P-12	.VALVE, SHUT- OFF (3/4 INCH NPT)	1
7	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-20162	.BULKHEAD, OIL DRAIN HOSE	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5325015893727	3AZG6	39101-76030	.NUT, CLINCH (M6 X 1.0 HEXSERT)	2
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015921168	05047	AES10M06A020WB4K42	.SCREW, HEX FLANGE HEAD (M6 X 1.0 X 20)	2
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015966482	44940	04-20166	.PLUG, PIPE (3/4 INCH NPT)	1
11	PCFZZ	PCFZZ	PCFZZ	PCFZZ		44430	256512-00185-473812- 000000	.HOSE, OIL	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	04-21742	.ADAPTER, BANJO	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015577264	0AK42	22190-220002	.WASHER, SEAL	2
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ			04-21764	.TUBE, DIPSTICK	1
								<b>END OF FIGURE</b>	





**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**OIL COOLER REPAIR PARTS LIST**



**Figure 33. Oil Cooler.**

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE		USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
									GROUP 090203	
									FIG. 33 OIL COOLER	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015095018	0B8S3	C6205615261	.COUPLING, PLAIN	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015097968	0B8S3	C0728100259	.CLAMP, HOSE	4
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015095008	0B8S3	C6205615281	.HOSE, PLAIN	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015094999	0B8S3	C6205615271	.HOSE, PLAIN	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015095011	0B8S3	C6205615251	.COUPLING, PLAIN	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2930015095000	0B8S3	C6205615400	.COOLER, OIL	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2940015098381	0B8S3	C6002112110	.ELEMENT, LUBRICATING OIL FILTER	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015095003	0B8S3	C6205615410	.COUPLING, PLAIN HOSE	1
									<b>END OF FIGURE</b>	



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**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
COALESCER REPAIR PARTS LIST**

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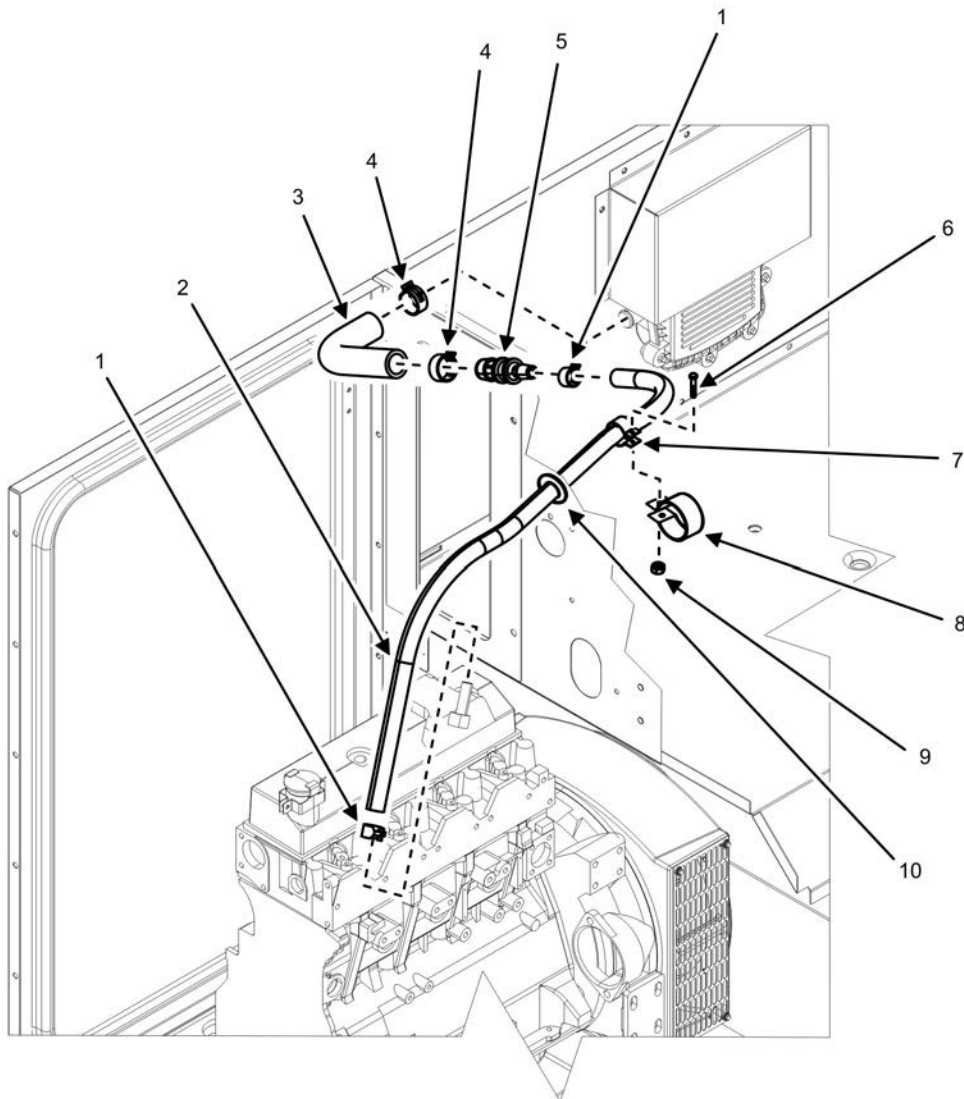


Figure 34. Coalescer (Sheet 1 of 3).

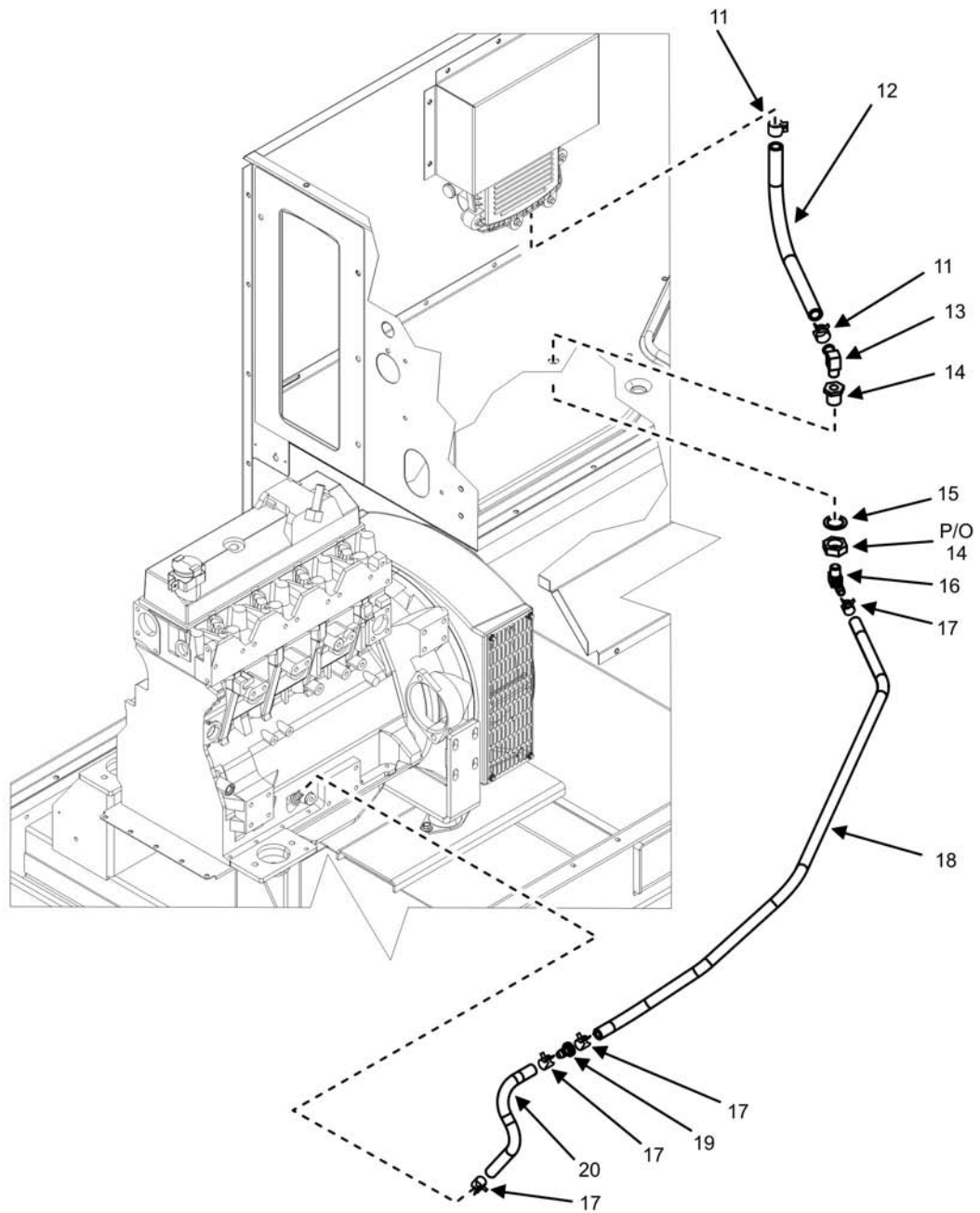


Figure 34. Coalescer (Sheet 2 of 3).

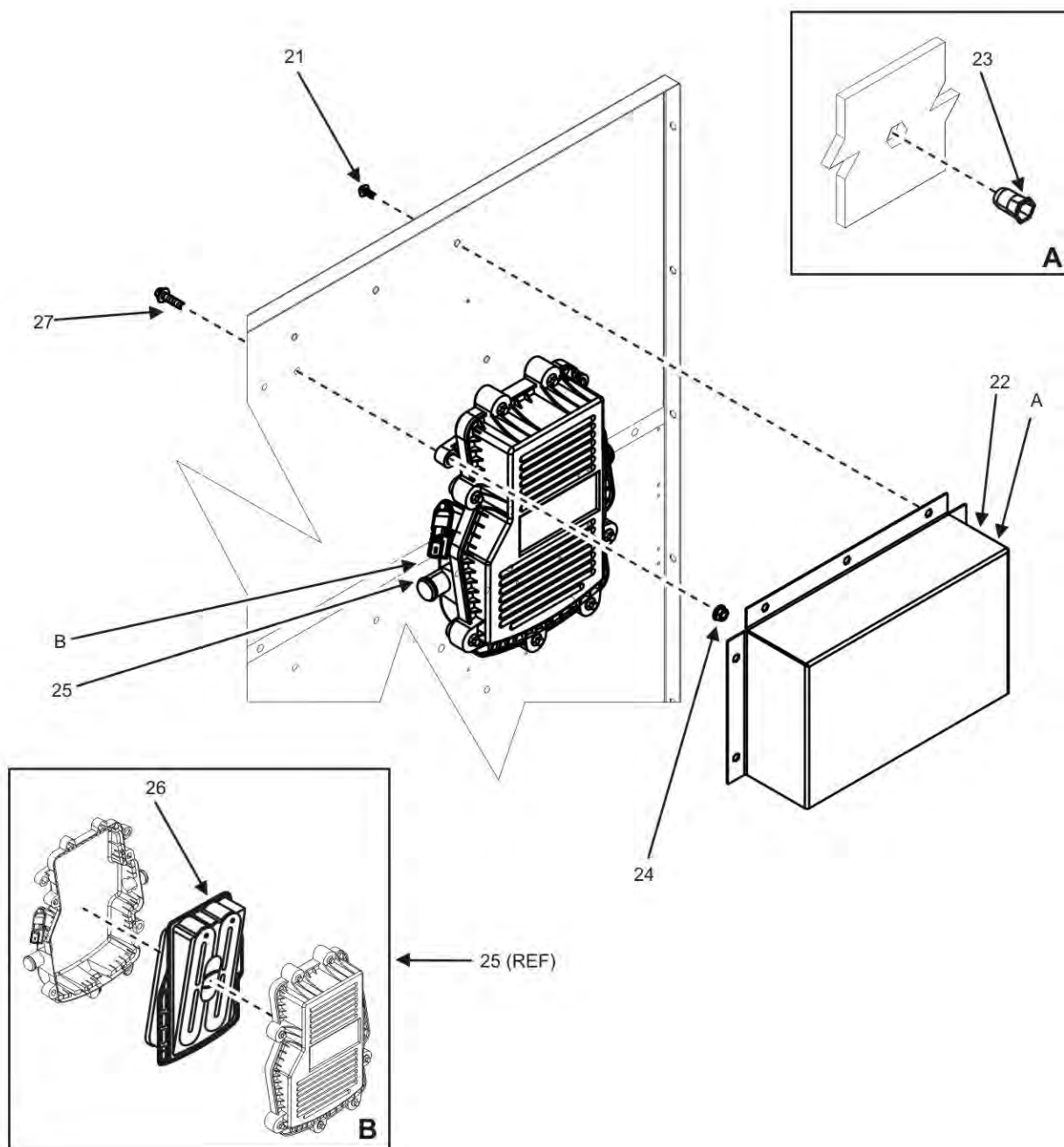


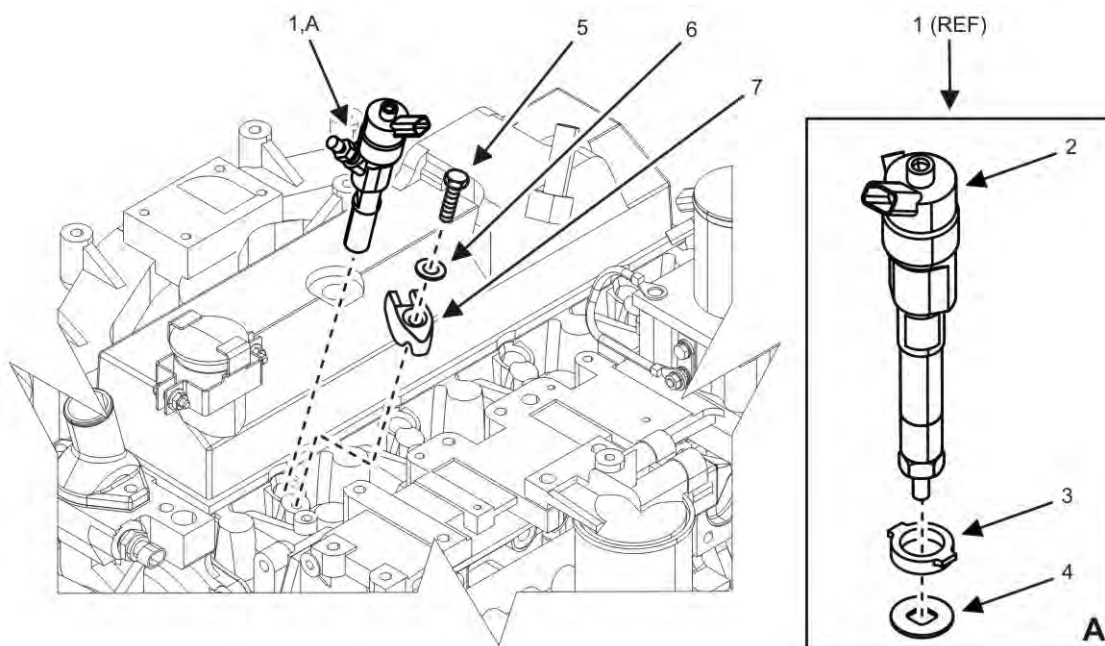
Figure 34. Coalescer (Sheet 3 of 3).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090204	
								FIG. 34 COALESCER	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015917731	44940	SAEJ1508CTB-22	.CLAMP, TYPE CTB	2
2	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21562-2	.HOSE, FUEL (5/8 INCH ID) (MAKE FROM 4219-0097 FROM BULK ITEMS LIST CUT TO LENGTH 1500 MM +/- 5)	1
3	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21513-1	.HOSE, OIL (1 INCH ID) (MAKE FROM 4230-0147 FROM BULK ITEMS LIST CUT TO LENGTH 232 MM +9.5/- 3.0)	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2815015915191	44940	SAEJ1508CTB-32	.CLAMP, TYPE CTB	2
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015938468	39428	5463K146	.FITTING, HOSE UNION	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5345015963576	05047	AES10M08B020WB4K42	.SCREW, HEX FLANGE HEAD M8 X 1.25 X 20	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340010813419	75272	COV-1313	.CLAMP, HOSE	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340010813419	75272	COV-3313	.CLAMP, HOSE	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ			DIN6923-M6	NUT, HEX FLANGE M6 X 1	1
10	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5325002708890	96906	MS35489-22	.GROMMET, NONMETALLIC	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508CTB-19	.CLAMP, TYPE CTB	2
12	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21563	.HOSE, OIL (1/2 INCH ID) (MAKE FROM 4219-0102 CUT TO LENGTH 325 MM +/- 5 FROM BULK ITEMS LIST)	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ12314-843146 0B	.ELBOW, HOSE	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730012456925	93061	207ACBHS-4	.ADAPTER, COUPLING	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	04-20118	.WASHER, SEALING M22	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730001362018	93061	129HB-6-4	.FITTING, HOSE BARB	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015917746	44940	SAEJ1508CTB-15	.CLAMP, TYPE CTB	4
18	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21510-1	.HOSE, OIL (3/8 INCH ID) (MAKE FROM 42190116 CUT TO LENGTH 1110 MM +/- 5 FROM BULK ITEMS LIST)	1
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4820015910618	4NUM0	Q458222A	.VALVE, CHECK, OIL	1

(1)	(2)				(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
20	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21510-2		.HOSE, OIL (3/8 INCH ID) (MAKE FROM 4219109 CUT TO LENGTH 225 MM+/- 5 FROM BULK ITEMS LIST)	1
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ		4M343	44832		.SCREW, FLANGE HEAD (M6 X 1.0 X 16)	7
22	XBFFF	XBFFF	XBFFF	XBFFF		44940	04-21489		.COVER, COALESCER	1
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5325015893727	3A2G6	39101-76030		.NUT, (M6 X 1 HEXSERT)	7
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M8		.NUT, HEX FLANGE HEAD (M8 X 1.25)	4
25	XBFFF	XBFFF	XBFFF	XBFFF		4NUM0	CV50612		.FILTER, BREATHER COALESCER	1
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2910015963766	4NUM0	CV5060700		.ELEMENT, COALESCER	1
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M08B030WB4K42		.SCREW, HEX FLANGE HEAD M8 X 1.25 X 30	4
END OF FIGURE										



**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**FUEL INJECTOR REPAIR PARTS LIST**



**Figure 35. Fuel Injector.**

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 090205									
FIG. 35 FUEL INJECTOR									
1	KFFFF	KFFFF	KFFFF	KFFFF		0B8S3	4955415	.ASSEMBLY, FUEL INJECTOR	4
2	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0B8S3	4941109	..INJECTOR, FUEL	1
3	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5340015967795	0B8S3	4944849	..SEAL, DUST	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015967788	0B8S3	4941112	..GASKET, INJECTOR	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015967804	0B8S3	C0143500840	.SCREW, HEX FLANGE HEAD CAP	4
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015967787	0B8S3	4941111	.WASHER, PLAIN	4
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2910015960527	0B8S3	4981453	.CLAMP, INJECTOR	4
END OF FIGURE									



FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
TURBOCHARGER REPAIR PARTS LIST

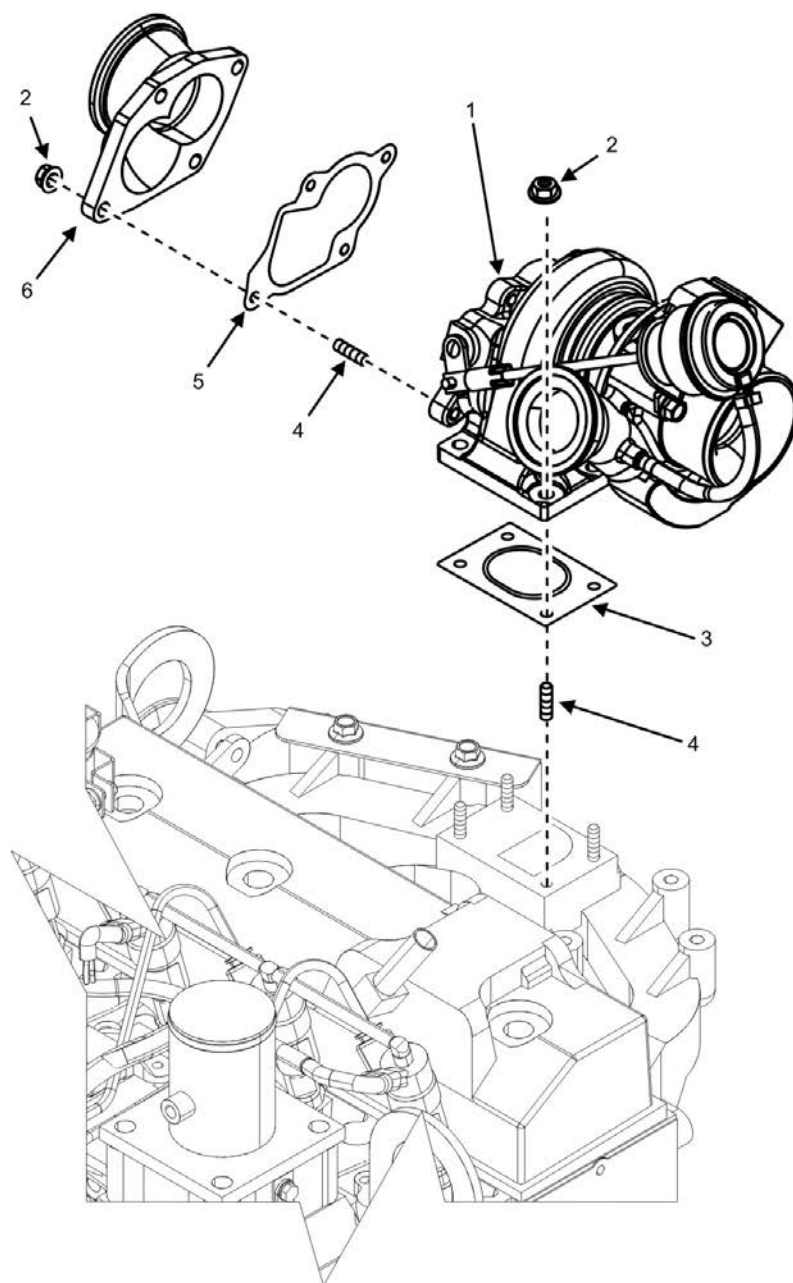


Figure 36. Turbocharger (Sheet 1 of 3).

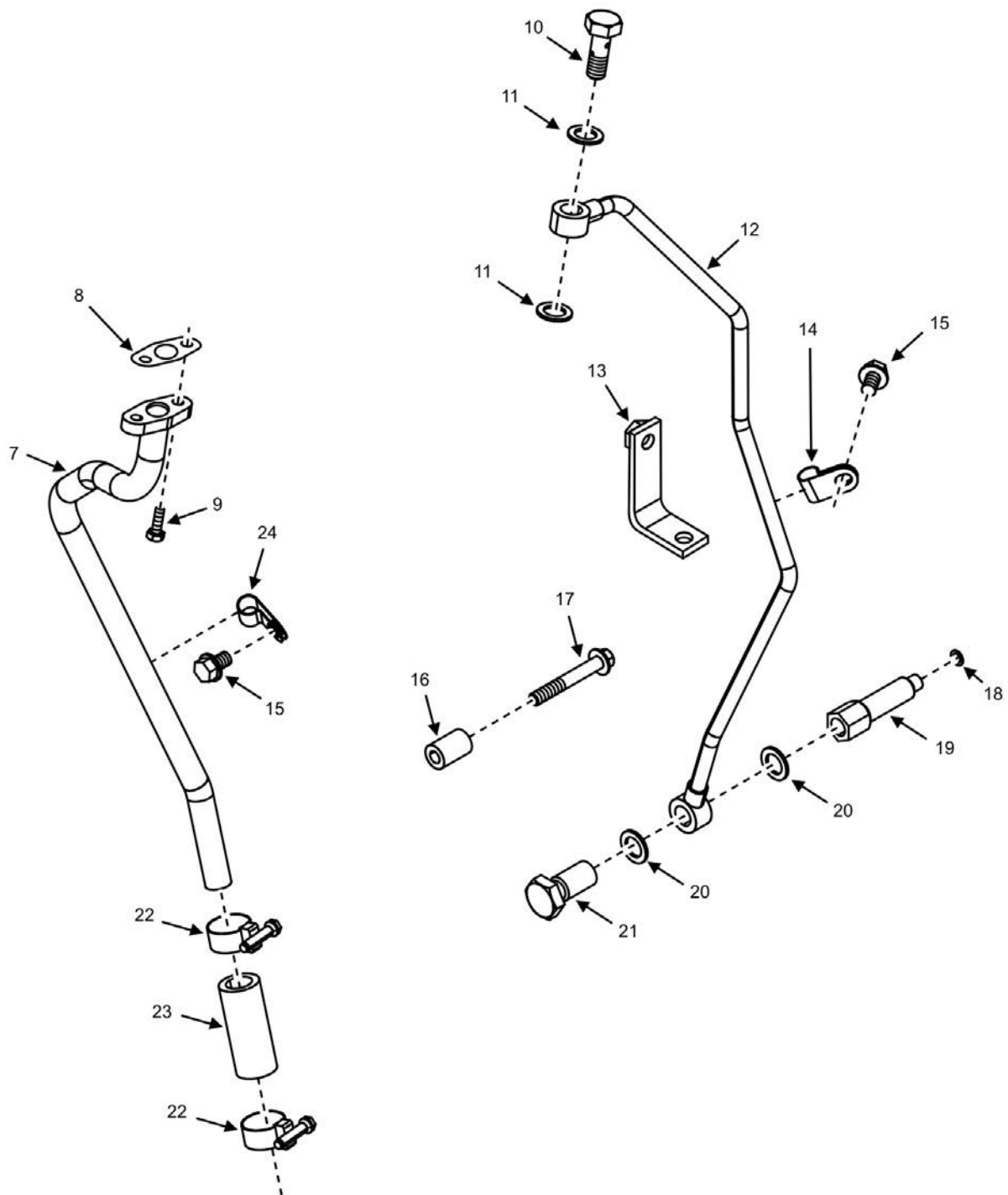


Figure 36. Turbocharger (Sheet 2 of 3).

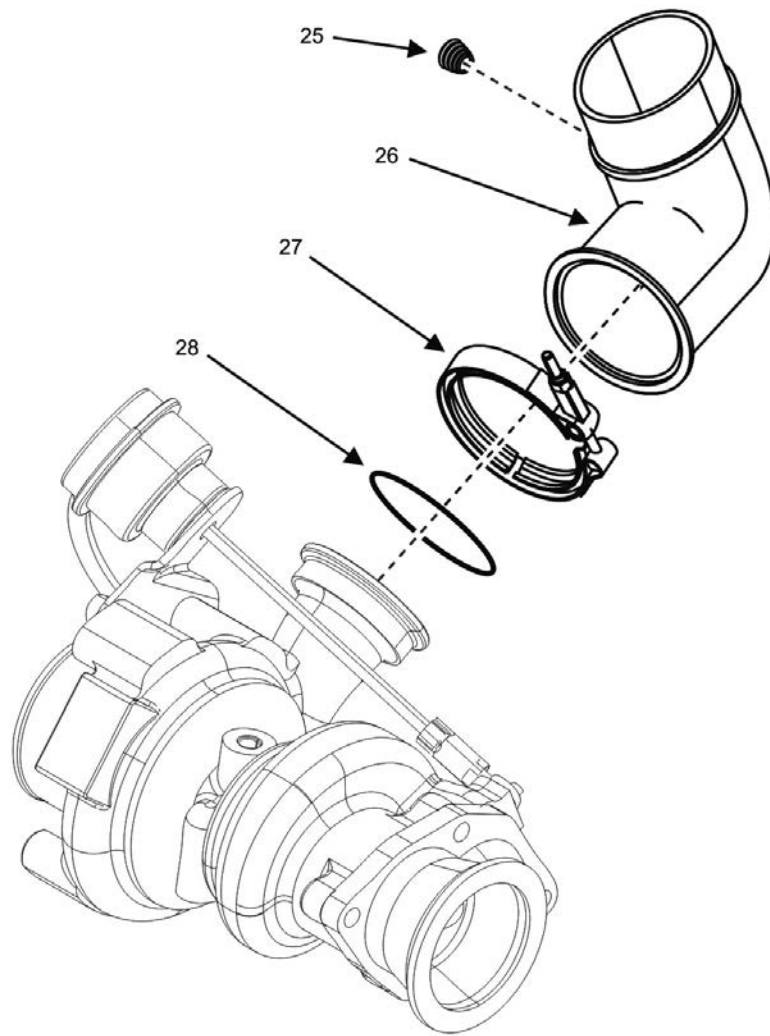
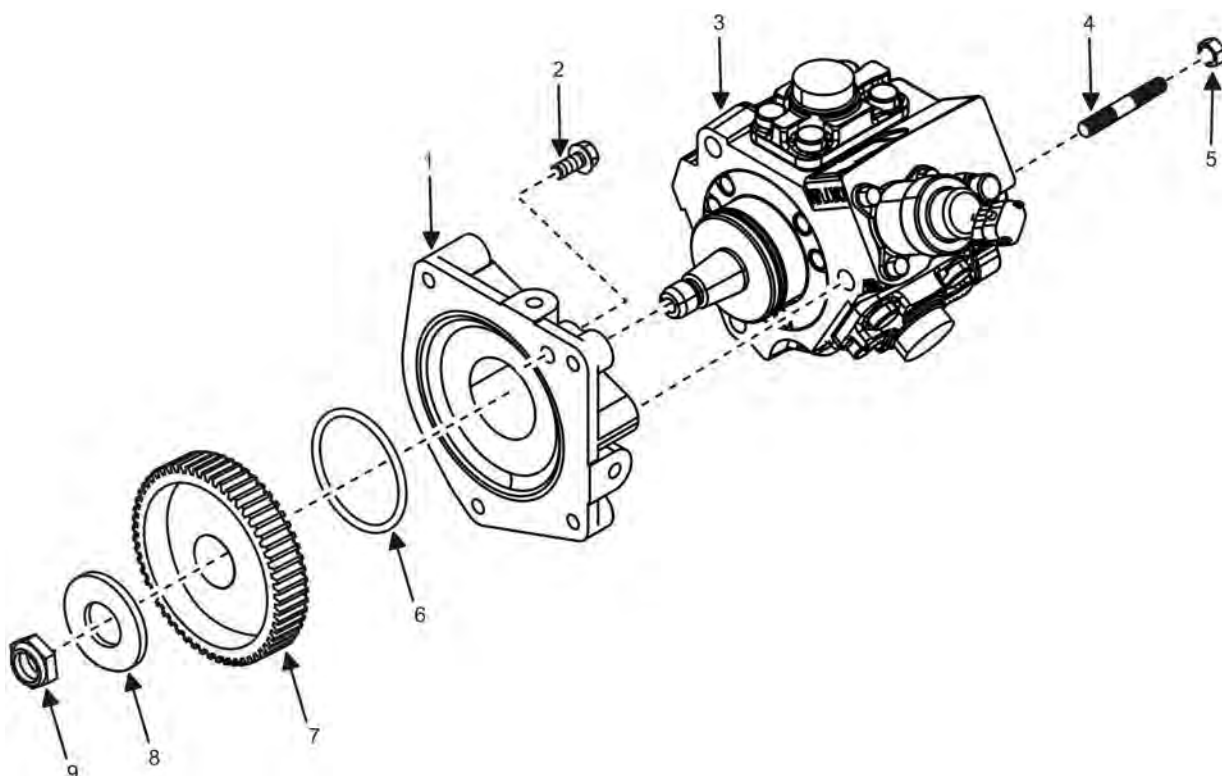


Figure 36. Turbocharger (Sheet 3 of 3).

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 090206									
FIG. 36 TURBOCHARGER									
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2950015959537	0B8S3	4944852	.TURBOCHARGER	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015098765	0B8S3	C6201115850	.NUT, REGULAR HEXAGON	4
3	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5330015089094	0B8S3	C6205115580	.GASKET, TURBOCHARGER TO EXHAUST MANIFOLD	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5307015106202	0B8S3	C0112460825	.STUD	4
5	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5330015960564	0B8S3	4941185	.GASKET, TURBINE OUTLET	1
6	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0B8S3	C6205115670	.CONNECTION, EXHAUST OUTLET	1
7	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0B8S3	4944855	.TUBE, TURBO OIL DRAIN	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015967817	0B8S3	C6205517611	.GASKET, OIL DRAIN	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015967803	0B8S3	C0143500616	.SCREW, HEXAGON HEAD CAP	2
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015093024	0B8S3	C6205518251	.SCREW, BANJO CONNECTOR	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015097934	0B8S3	3094065	.WASHER, SEALING	2
12	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0B8S3	4944853	.TUBE, TURBO OIL SUPPLY	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015094088	0B8S3	C6205518490	.BRACKET, OIL TUBE	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015966650	0B8S3	C6205518560	.CLIP	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015100796	0B8S3	C0143500814	.SCREW, HEX FLANGE HEAD CAP	2
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5365015091247	0B8S3	C6205516850	.SPACER, MOUNTING	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015967806	0B8S3	C0143500850	.SCREW, HEX FLANGE HEAD CAP	1
18	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5331014812514	0B8S3	3678925	.SEAL, O-RING	1
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015967452	0B8S3	4984028	.NIPPLE, COUPLING	1
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310013354861	15434	3918192	.WASHER, SEALING	2
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015097929	0B8S3	3094020	.SCREW, BANJO CONNECTOR	1
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015960532	0B8S3	C0728100289	.CLAMP, HOSE	2
23	PCFZZ	PCFZZ	PCFZZ	PCFZZ	4720015960175	0B8S3	C6205518450	.HOSE, PLAIN	1
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015967792	0B8S3	4944962	.CLIP	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730011659491	15434	3008465	.PLUG, PIPE	1
26	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0B8S3	3918686	.PIPE, AIR TRANSFER	1
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015967785	0B8S3	3918951	.CLAMP, V BAND	1
28	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5331015964575	0B8S3	3918952	.SEAL, O-RING	1
END OF FIGURE									

**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**HIGH-PRESSURE FUEL PUMP REPAIR PARTS LIST**



**Figure 37. High-Pressure Fuel Pump.**

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 090207									
FIG. 37 HIGH-PRESSURE FUEL PUMP									
1	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0B8S3	4941175	.SUPPORT, FUEL PUMP	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015095005	0B8S3	C6206213930	.SCREW, HEXAGON HEAD CAP	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2910015959022	0B8S3	4941173	.PUMP, FUEL	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5307015967797	0B8S3	4944945	.STUD	3
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015104529	0B8S3	C0158400806	.NUT, HEXAGON FLANGE	3
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5331015966637	0B8S3	4944947	.SEAL, O-RING	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3020015960520	0B8S3	4941174	.GEAR, FUEL PUMP	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015098383	0B8S3	C6130321361	.WASHER, PLAIN	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015967778	0B8S3	3863271	.NUT, REGULAR HEXAGON	1
END OF FIGURE									





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**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
FUEL RAIL AND FUEL LINES REPAIR PARTS LIST**

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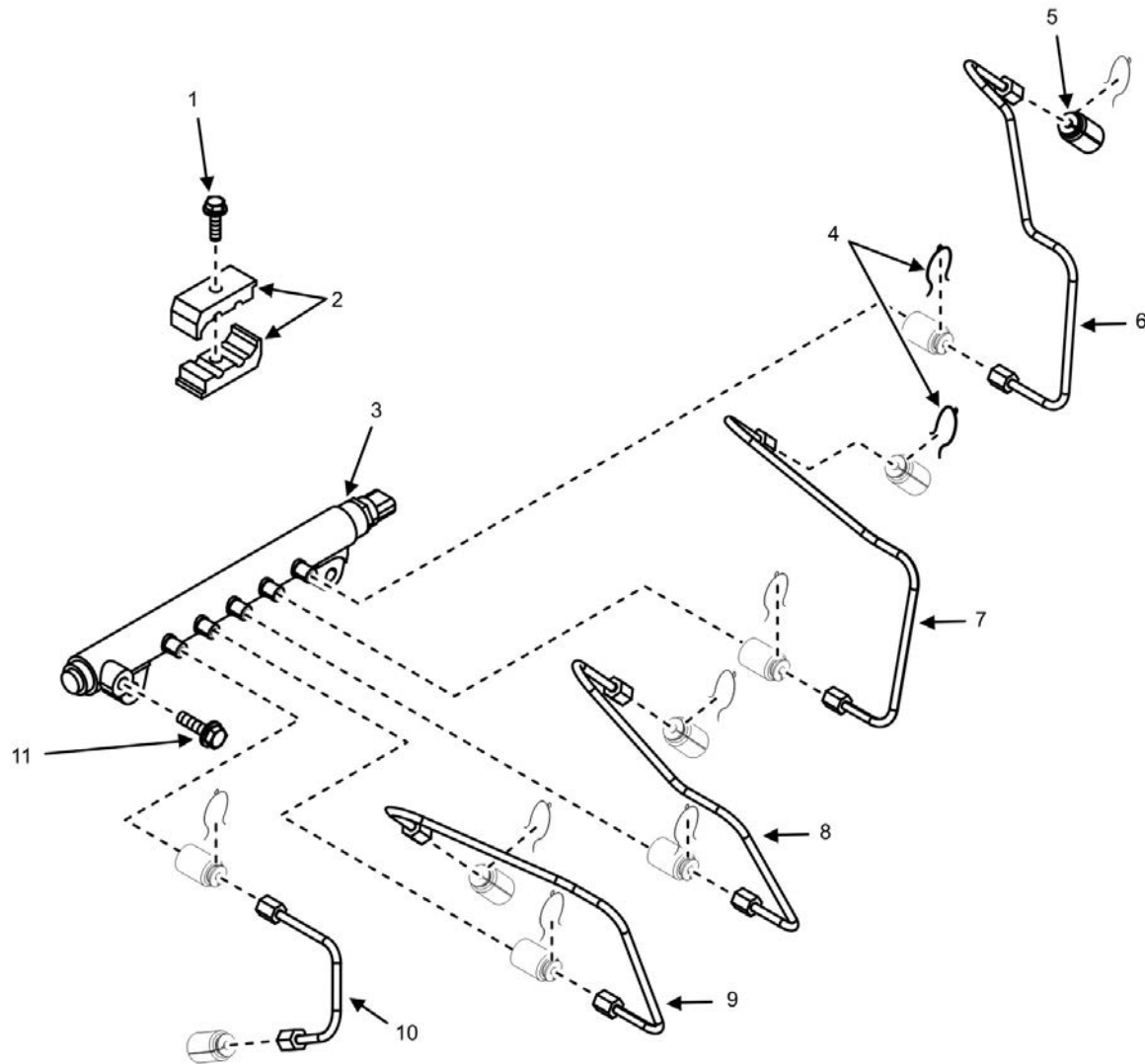


Figure 38. Fuel Rail and Fuel Lines (Sheet 1 of 3).

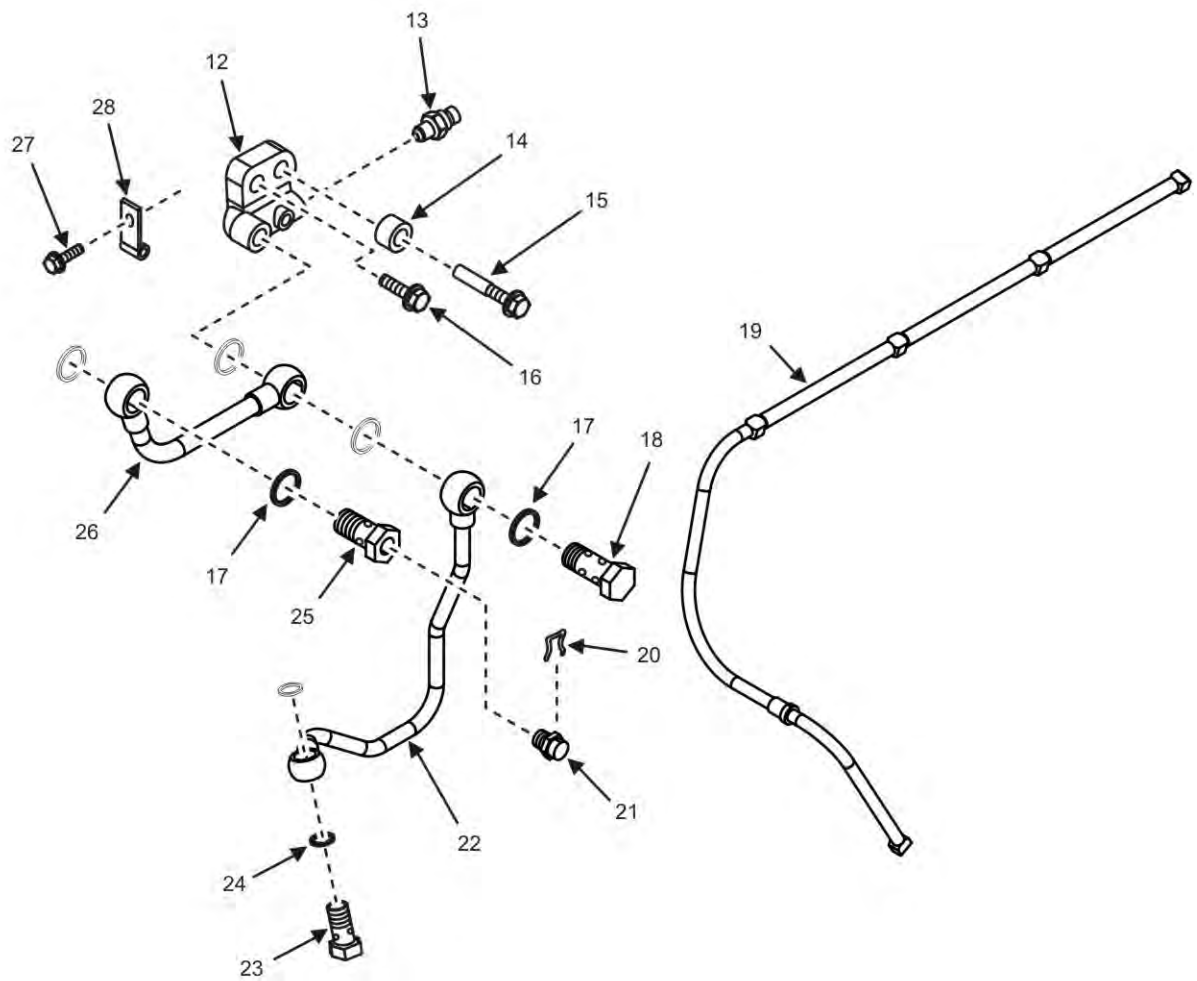


Figure 38. Fuel Rail and Fuel Lines (Sheet 2 of 3).

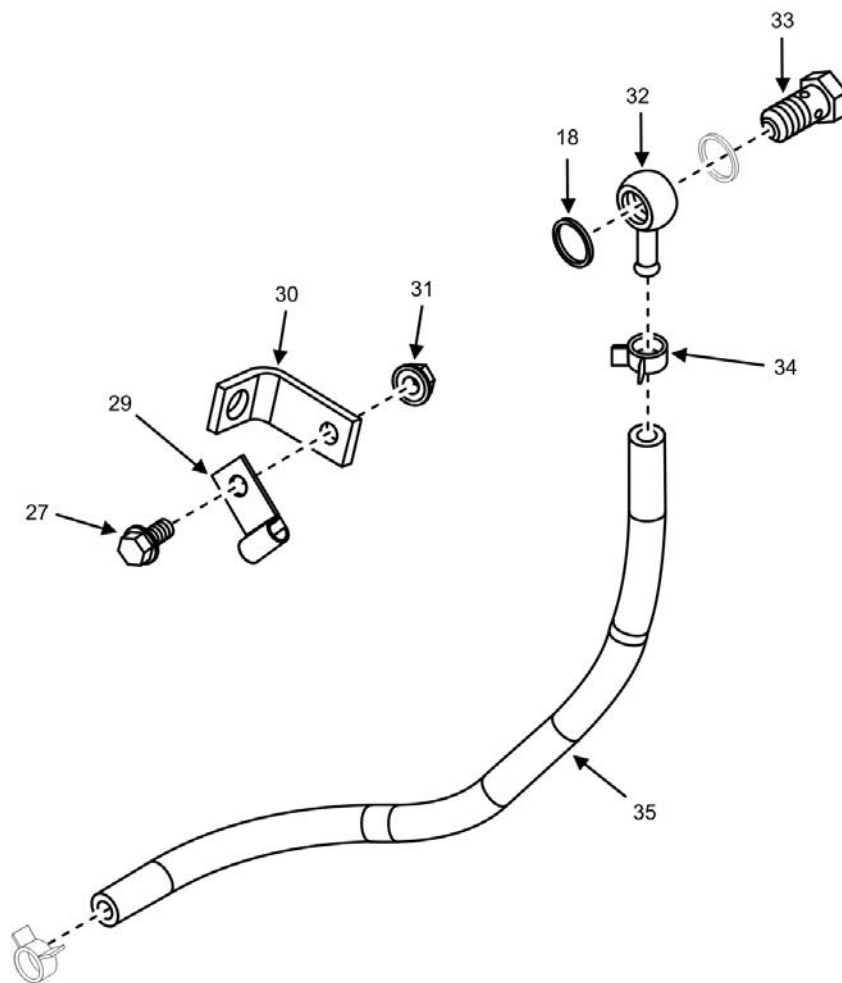


Figure 38. Fuel Rail and Fuel Lines (Sheet 3 of 3).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090208	
								FIG. 38 FUEL RAIL AND FUEL LINES	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015967789	0B8S3	4944993	.CLAMP, TUBE	4
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015967808	0B8S3	C0143500625	.SCREW, HEX FLANGE HEAD CAP	2
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015959472	0B8S3	4941152	.RAIL, FUEL	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015967802	0B8S3	4934062	.CLIP	10
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015956688	0B8S3	4941162	.COVER, PROTECTIVE	10
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4710015959450	0B8S3	4941157	.TUBE, INJECTOR FUEL SUPPLY (CYLINDER #4)	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4710015959440	0B8S3	4941156	.TUBE, INJECTOR FUEL SUPPLY (CYLINDER #3)	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4710015959420	0B8S3	4941155	.TUBE, INJECTOR FUEL SUPPLY (CYLINDER #2)	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4710015959402	0B8S3	4941153	.TUBE, INJECTOR FUEL SUPPLY (CYLINDER #1)	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4710015959463	0B8S3	4941158	.TUBE, INJECTOR FUEL SUPPLY	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015100798	0B8S3	C0143501035	.SCREW, HEX FLANGE HEAD CAP (M10 X 1.50 X 35)	2
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015960728	0B8S3	4941160	.ADAPTER, FUEL CONNECTOR	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015959550	98441	6M14F82EDMXS	.FITTING, CONNECTOR (9/16 INCH JIC TO M14)	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5975015955716	0B8S3	3092334	.SPACER, MOUNTING	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015100850	0B8S3	C0143501045	.SCREW, HEX FLANGE HEAD CAP (M10 X 1.50 X 45)	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0B8S3	C0143501025	.SCREW, HEX FLANGE HEAD CAP	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310013354861	15434	3918192	.WASHER, SEALING (M14)	7
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015968128	0B8S3	3092299	.SCREW, BANJO CONNECTOR (27MM)	1
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4720015960053	0B8S3	4941164	.HOSE, PLAIN	1
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5315015967794	0B8S3	4941166	.PIN, ROLL	1
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015960477	0B8S3	4941165	.CONNECTOR, BANJO	1
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4710015960217	0B8S3	4941161	.TUBE, FUEL SUPPLY	1

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015968129	0B8S3	3864114	.SCREW, BANJO CONNECTOR	1
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0B8S3	C0700501212	.WASHER, SEALING	2
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015968124	0B8S3	4944952	.SCREW, BANJO CONNECTOR	1
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4710015960197	0B8S3	4941159	.TUBE, FUEL SUPPLY	1
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0B8S3	C0143500816	.SCREW, HEX FLANGE HEAD CAP	2
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015967780	0B8S3	3863942	.CLIP	1
29	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0B8S3	3863772	.CLIP	1
30	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0B8S3	4944942	.PLATE, CLAMPING	1
31	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015104529	0B8S3	C0158400806	.NUT, HEXAGON FLANGE	1
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2815015959101	0B8S3	3864273	.COUPLING, PLAIN HOSE	1
33	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015097929	0B8S3	3094020	.SCREW, BANJO CONNECTOR	2
34	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015967801	0B8S3	4944941	.CLIP	2
35	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4720015960081	0B8S3	4944943	.HOSE, PLAIN	1
END OF FIGURE									

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**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
SPIN-ON FUEL FILTER REPAIR PARTS LIST**

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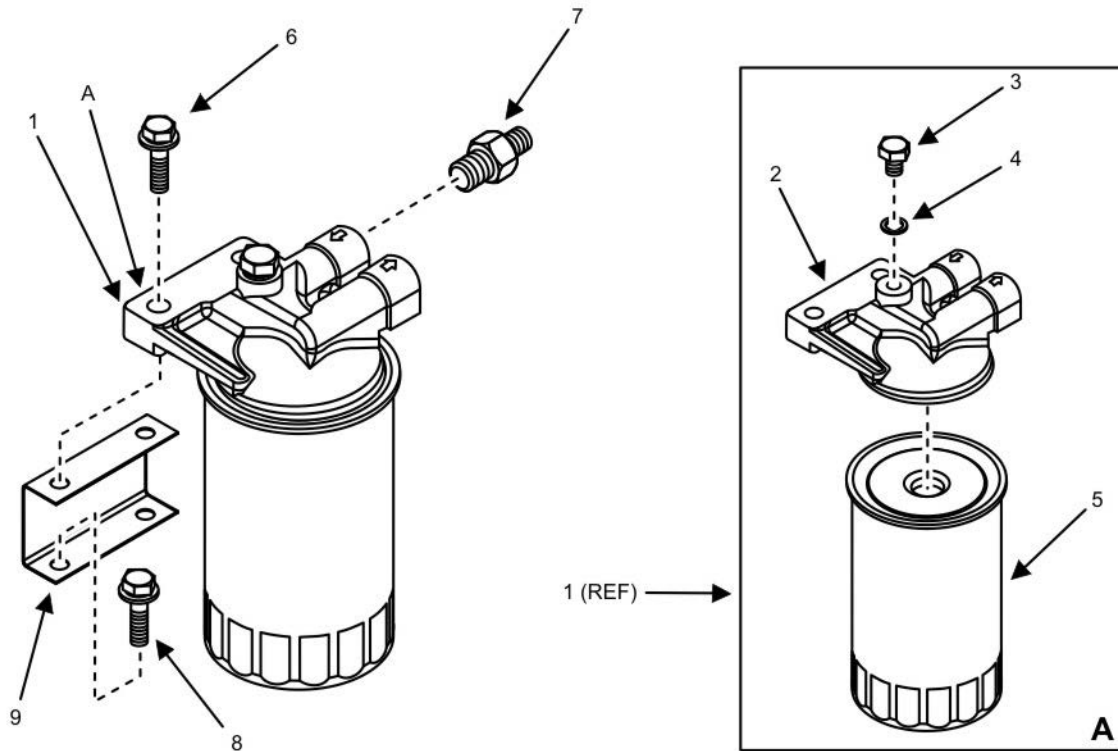


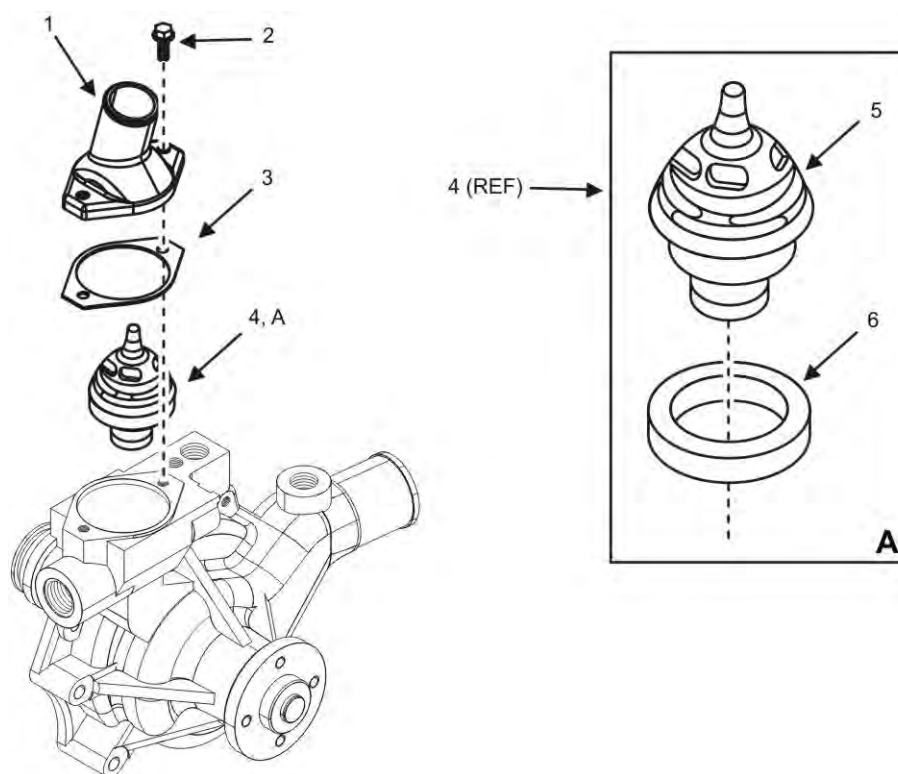
Figure 39. Spin-On Fuel Filter.



(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 090209	
								FIG. 39 SPIN-ON FUEL FILTER	
1	PAFFF	PAFFF	PAFFF	PAFFF	2910015959235	0B8S3	4941163	.ASSEMBLY, FUEL FILTER	1
2	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0B8S3	4941198	..HEAD, FUEL FILTER	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5365015967776	0B8S3	3092085	..PLUG, THREADED	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015097935	0B8S3	3093980	..WASHER, SEALING	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2910015959085	0B8S3	4942437	..ELEMENT, FUEL FILTER	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015091582	0B8S3	3925344	.SCREW, HEX FLANGE HEAD CAP	2
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015959550	98441	6M14F82EDMXS	.FITTING, CONNECTOR (9/16 INCH JIC TO M14)	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015919022	44940	AES10M10C020WB4K42	SCREW, HEX, FLANGE HEAD (M10 X 1.5 X 20MM)	2
9	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21722	.BRACKET, MOUNTING, FUEL FILTER	1
								END OF FIGURE	



**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**THERMOSTAT REPAIR PARTS LIST**



**Figure 40. Thermostat.**

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090210	
								FIG. 40 THERMOSTAT	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2930015099118	0B8S3	C6204116421	.CONNECTION, WATER OUTLET	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0B8S3	C0143500820	.SCREW, HEX FLANGE HEAD	2
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6685015089059	0B8S3	3800884	CAP	1
4	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0B8S3	C6004216120	.ASSEMBLY, THERMOSTAT	1
5	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5330015100103	0B8S3	C6140116331	..THERMOSTAT	1
								..GASKET, THERMOSTAT	1
								END OF FIGURE	



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**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
WATER PUMP REPAIR PARTS LIST**

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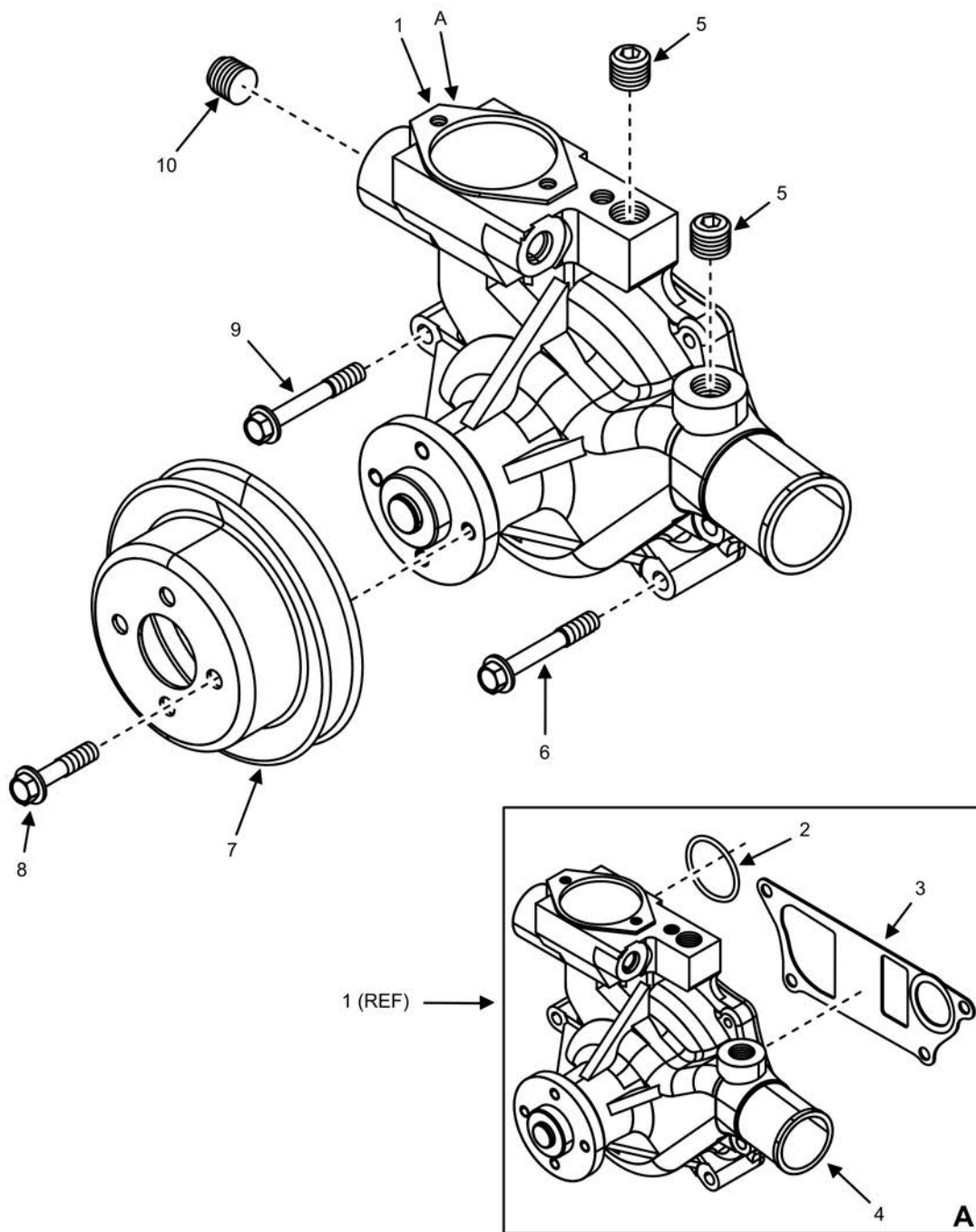


Figure 41. Water Pump.

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC FORCE	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
							GROUP 090211	
							FIG. 41 WATER PUMP	
1	KFFFF	KFFFF	KFFFF	KFFFF		0B8S3 4955417	.ASSEMBLY, WATER PUMP	1
2	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5331015093685	0B8S3 C0700003040	..SEAL, O-RING	1
3	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5330015964681	0B8S3 C6206611731	..GASKET, WATER PUMP	1
4	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0B8S3 4941151	..PUMP, WATER	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5365015967790	0B8S3 4944472	.PLUG, THREADED	2
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0B8S3 C0143500855	.SCREW, HEX FLANGE HEAD CAP	3
7	XBFZZ	XBFZZ	XBFZZ	XBFZZ		0B8S3 4990890	.PULLEY, WATER PUMP	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015100796	0B8S3 C0143500814	.SCREW, HEX FLANGE HEAD CAP	4
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015100798	0B8S3 C0143500850	.SCREW, HEX FLANGE HEAD CAP	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		0B8S3 4944473	.PLUG, THREADED	1
							END OF FIGURE	





FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
BATTERY-CHARGING ALTERNATOR AND BELT REPAIR PARTS LIST

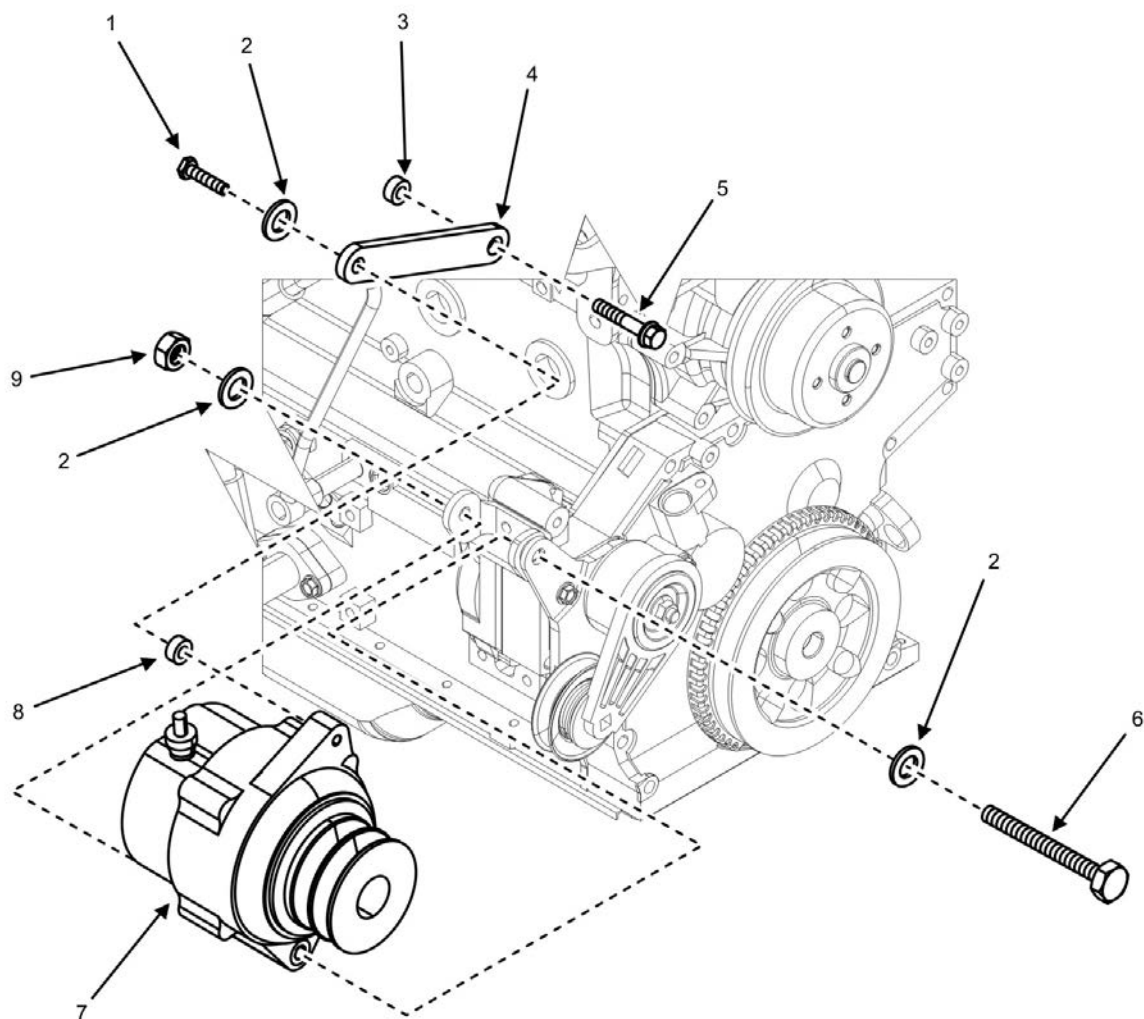


Figure 42. Battery-Charging Alternator and Belt (Sheet 1 of 2).

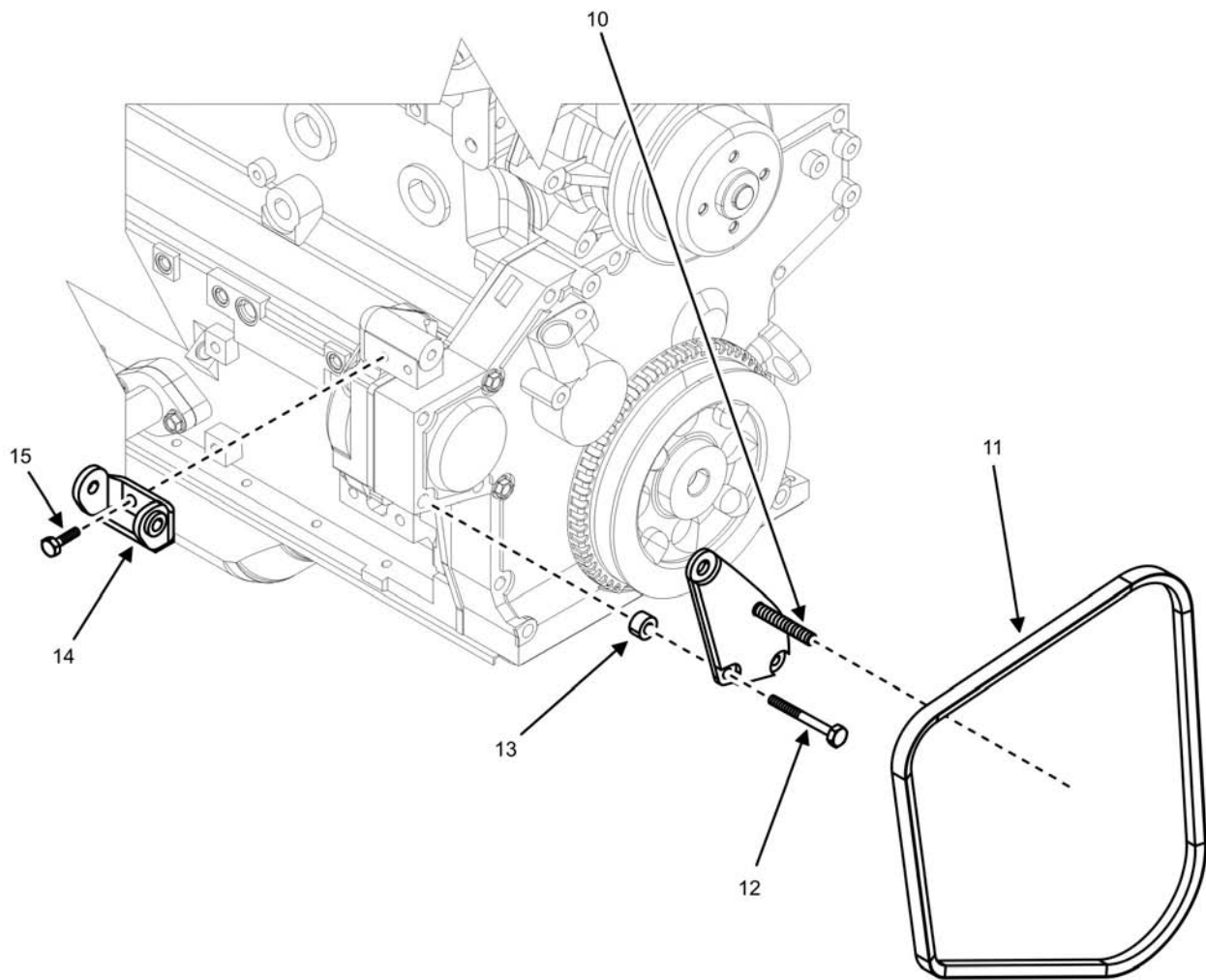
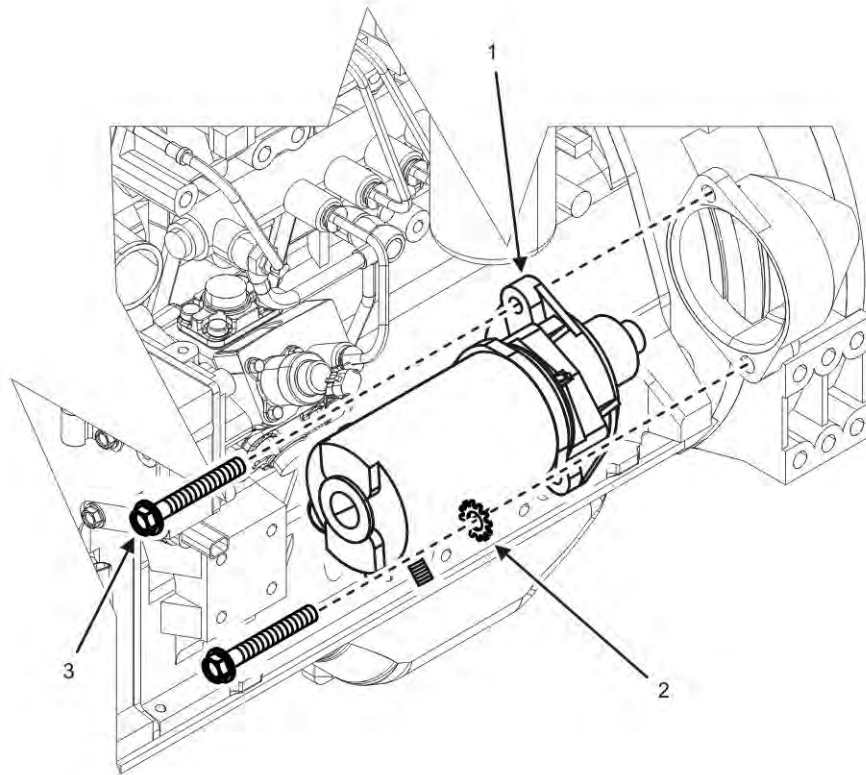


Figure 42. Battery-Charging Alternator and Belt (Sheet 2 of 2).

(1)	(2)				(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
									GROUP 090212	
									FIG. 42 BATTERY- CHARGING ALTERNATOR AND BELT	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	3863343		.SCREW, HEX FLANGE HEAD CAP	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015967777	15434	3335076		.WASHER, BEVEL	2
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3040015960310	15434	C2055475870		.COLLAR, SHAFT	1
4	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21239		.BRACKET, ALTERNATOR	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	C0143501025		.SCREW, HEX FLANGE HEAD CAP	2
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	3863143		.SCREW, HEXAGON HEAD CAP	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2920015959464	15434	4945839		.ALTERNATOR, BATTERY CHARGING	1
8	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	C6130121961		.SPACER, COOLER SUPPORT	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	3094937		.NUT, REGULAR HEXAGON	1
10	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21567		.BRACKET, MOUNTING, TENSIONER	1
11	PCFZZ	PCFZZ	PCFZZ	PCFZZ	3030005041371	47WU2	BX509013-2050		.BELT, V-DRIVE (5/8 INCH X 52 INCH)	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M08B080WB4K42		.SCREW, HEX FLANGE HEAD M8 X 1.25. X 80	1
13	XBFZZ	XBFZZ	XBFZZ	XBFZZ		OLTJ8	C6204816740		.SPACER, MOUNTING	1
14	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	C6204816321		.BRACKET, ALTERNATOR	1
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	3093730		.SCREW, HEX FLANGE HEAD CAP	2
									END OF FIGURE	



**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
STARTER REPAIR PARTS LIST**

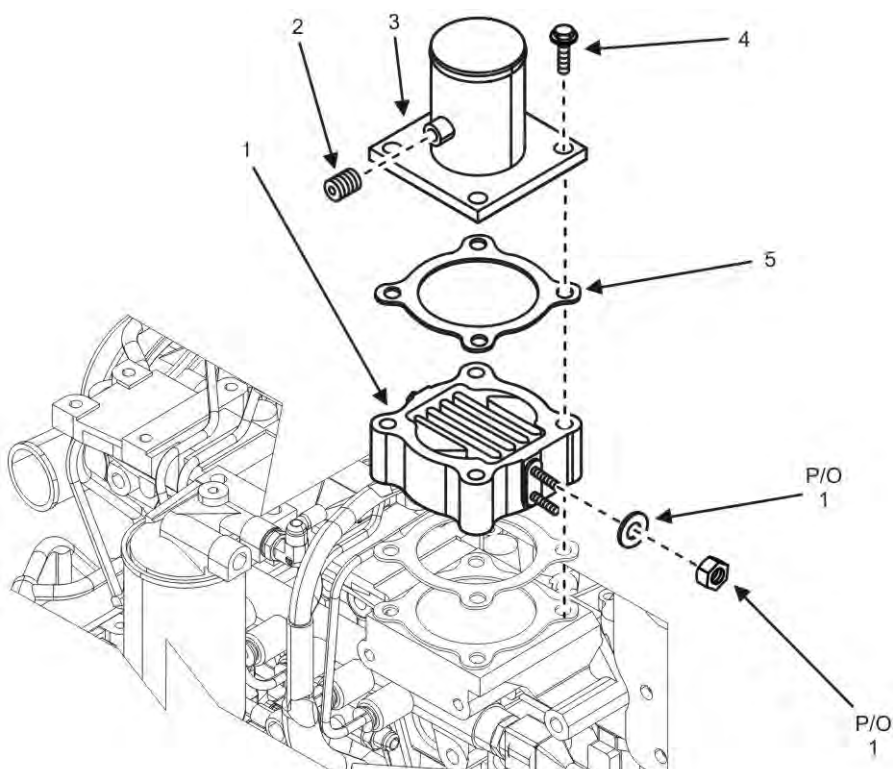


**Figure 43. Starter.**

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 090213									
FIG. 43 STARTER									
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6110015893950	0B8S3	4948534	.MOTOR, STARTING	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015928026	05047	AEW22X500000EA1AA1	WASHER, LOCK,	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015100857	0B8S3	C0143501235	.SCREW, HEX HEAD FLANGE	2
END OF FIGURE									



**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**INTAKE AIR HEATER REPAIR PARTS LIST**



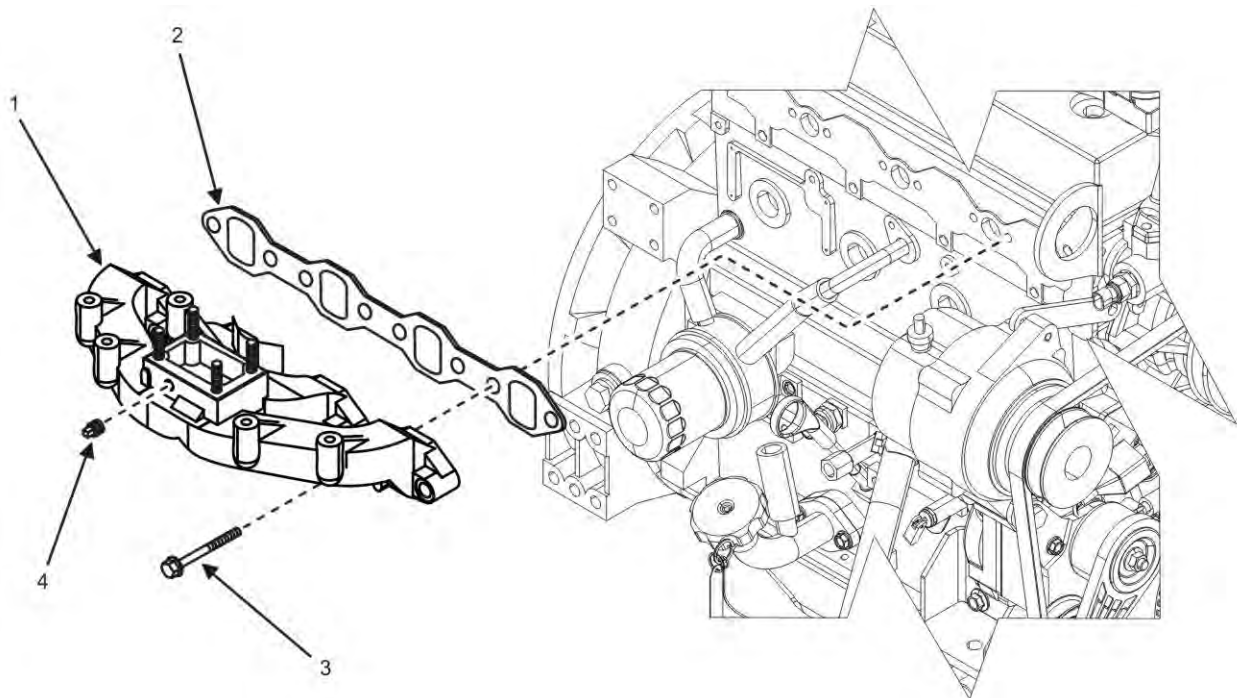
**Figure 44. Intake Air Heater.**

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 090214									
FIG. 44 INTAKE AIR HEATER									
1	PBFZZ	PBFZZ	PBFZZ	PBFZZ	2990015960562	15434	C6008152341	.HEATER, INTAKE AIR	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730011659491	15434	3008465	.PLUG, PIPE	1
3	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	4944557	.CONNECTION, AIR INTAKE	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015967809	15434	C0143501070	.SCREW, HEX FLANGE HEAD	4
5	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5330015967865	15434	C6204114850	CAP	2
.GASKET, CONNECTION									
END OF FIGURE									





**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**INTAKE MANIFOLD REPAIR PARTS LIST**

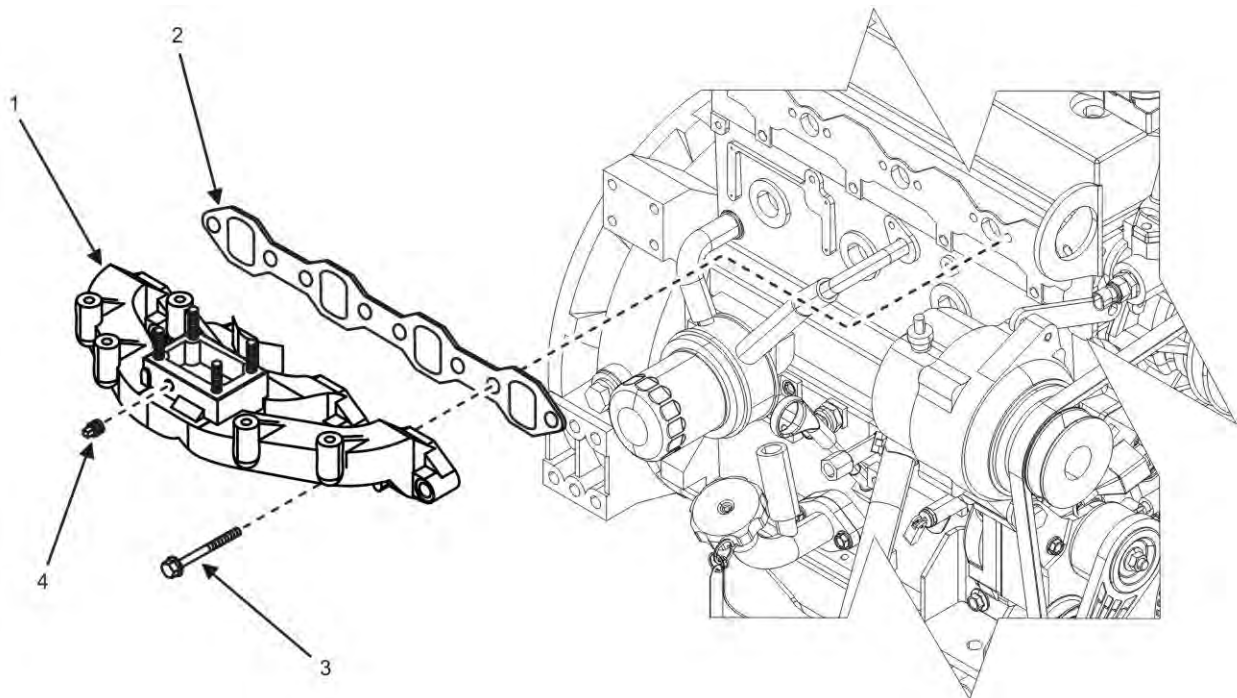


**Figure 45. Intake Manifold.**

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 090215									
FIG. 45 INTAKE MANIFOLD									
1	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	4941168	.MANIFOLD, AIR INTAKE	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015100772	15434	C0143501065	.SCREW, HEX FLANGE HEAD CAP	2
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015960570	15434	C0143501075	.SCREW, HEX FLANGE HEAD CAP	6
END OF FIGURE									



**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**EXHAUST MANIFOLD REPAIR PARTS LIST**



**Figure 46. Exhaust Manifold.**

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 090216									
FIG. 46. EHAUST MANIFOLD									
1	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	4941184	.MANIFOLD, EXHAUST	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015967819	15434	C6205115811	.GASKET, EXHAUST MANIFOLD	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015100850	0B8S3	C0143501045	.SCREW, HEX FLANGE HEAD CAP	8
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015092576	0B8S3	C0704220108	.PLUG, PIPE	1
END OF FIGURE									



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**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
OIL PAN AND STRAINER REPAIR PARTS LIST**

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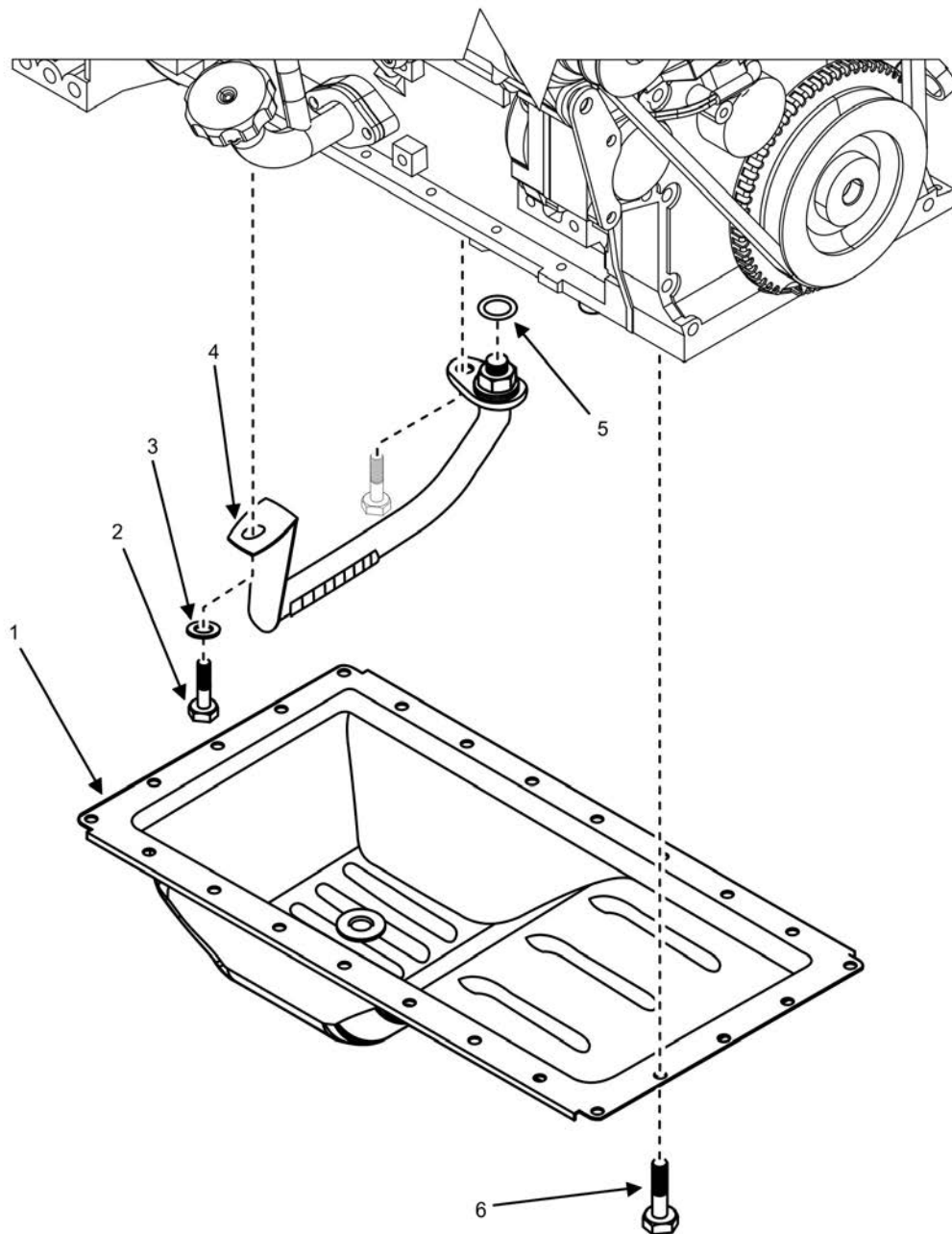


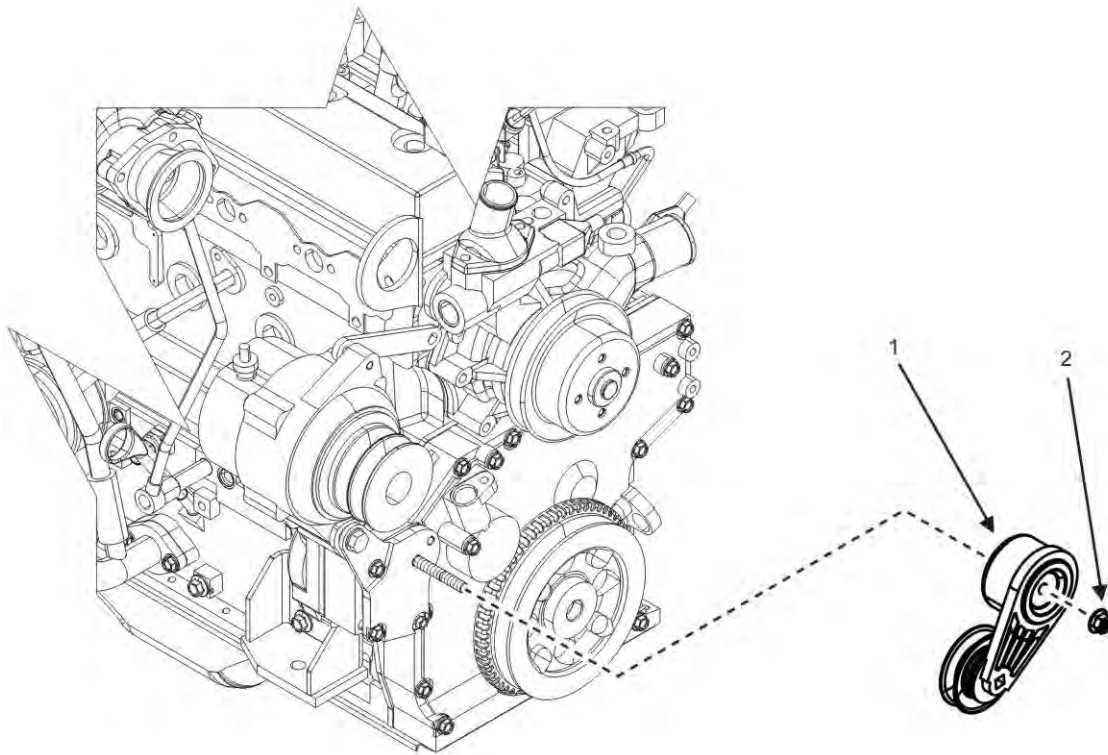
Figure 47. Oil Pan and Strainer.

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 090217	
								FIG. 47. OIL PAN AND STRAINER	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2815015090480	15434	C6204215112	.PAN, OIL	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	C0143500816	.SCREW, HEX FLANGE HEAD CAP	2
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015106151	15434	C0164330823	.WASHER, PLAIN	1
4	PAHZZ	PAHZZ	PAHZZ	PAHZZ	4710015090487	15434	C6204516130	.TUBE, LUBE OIL SUCTION	1
5	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5331015090468	15434	C6204516122	.SEAL, OIL RING	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015100796	15434	C0143500814	.SCREW, HEX FLANGE HEAD CAP	24
								END OF FIGURE	





**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**BELT TENSIONER AND IDLER PULLEY REPAIR PARTS LIST**

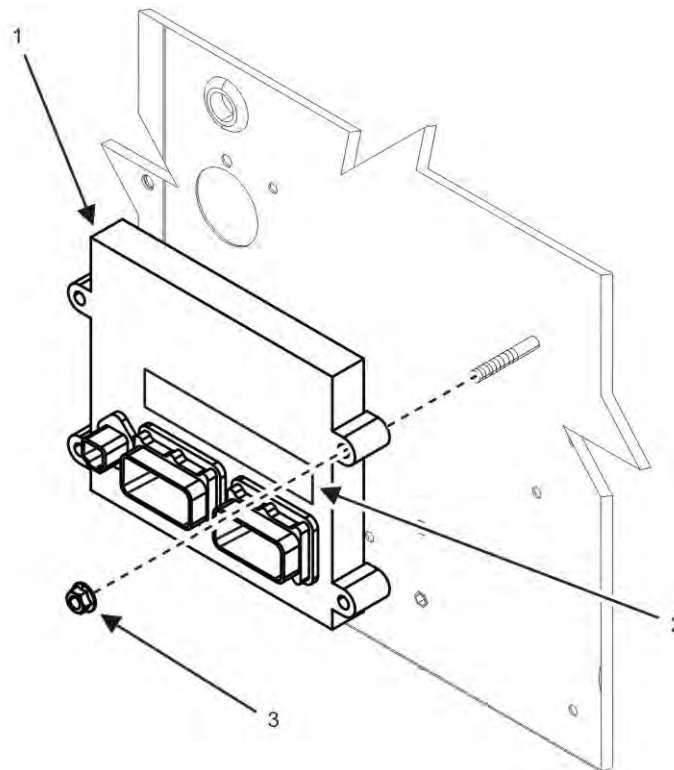


**Figure 48. Belt Tensioner and Idler Pulley.**

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090218	
								FIG. 48 BELT TENSIONER AND IDLER PULLEY	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3950015967774	44940	04-21369	.TENSIONER, BELT	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M10	.NUT, HEX FLANGE M10 X 1.5	1
								END OF FIGURE	



**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**ENGINE ECM REPAIR PARTS LIST**



**Figure 49. Engine ECM.**

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
GROUP 090219									
FIG. 49 ENGINE ECM									
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	4988821	.MODULE, ELECTRONIC CONTROL	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	9905015082346	0B8S3	3609867	.PLATE, IDENTIFICATION	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M8	.NUT, PLAIN, EXTENDED	4
END OF FIGURE									



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**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
ENGINE ECM WIRING HARNESS REPAIR PARTS LIST**

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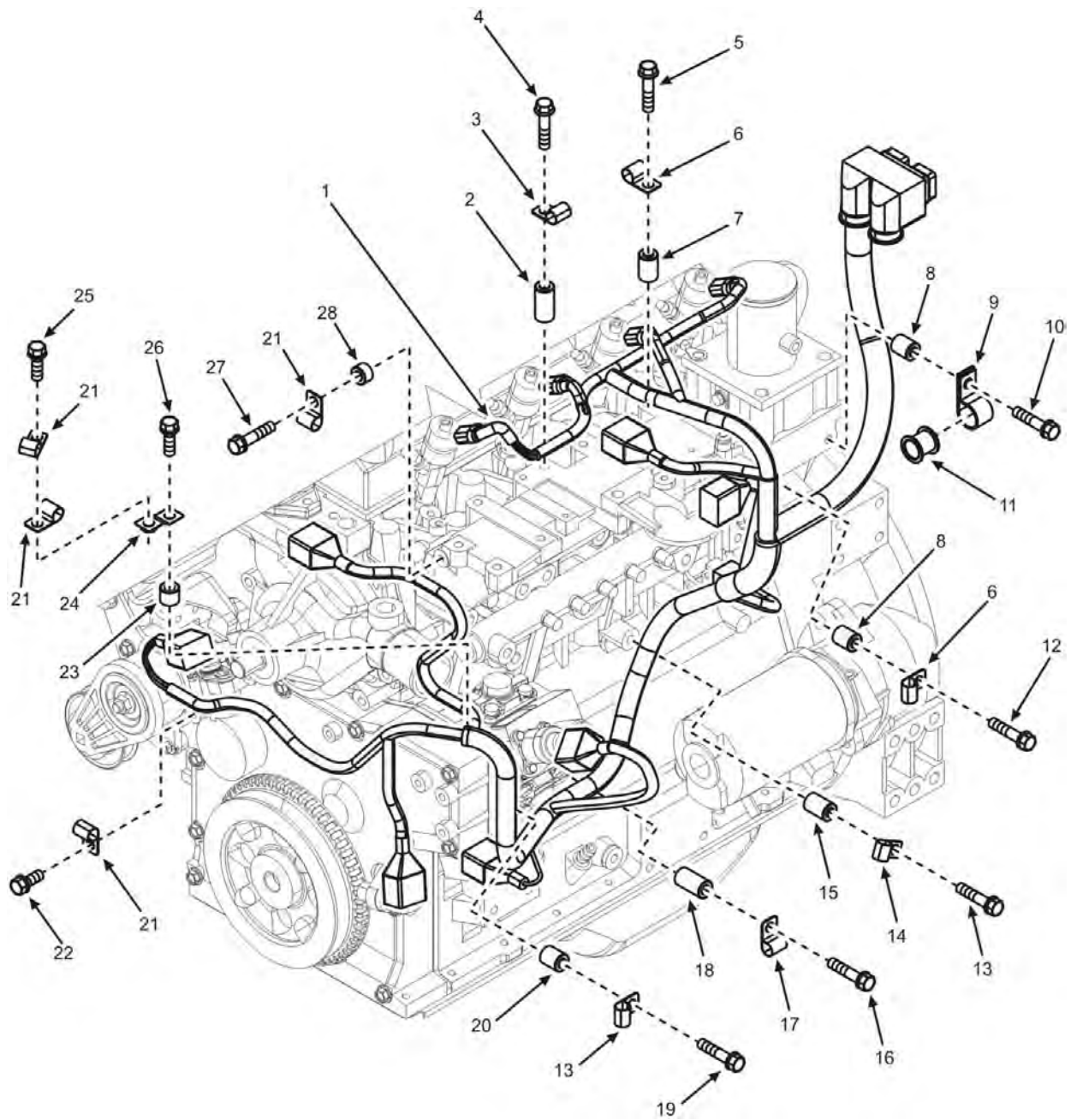


Figure 50. Engine ECM Wiring Harness.

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090220	
								FIG. 50 ENGINE ECM WIRING HARNESS	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5995015955733	15434	4944868	.WIRING HARNESS	1
2	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	4096340	.SPACER, MOUNTING	1
3	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	4944971	.CLIP	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015100772	0B8S3	C0143501065	.SCREW, CAP, HEXAGON	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015967804	15434	C0143500840	.SCREW, CAP, HEXAGON	1
6	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	4944969	.CLIP	2
7	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	3863313	.SPACER, MOUNTING	1
8	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	4095528	.SPACER, MOUNTING	2
9	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	4095890	.CLIP	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015919022	44940	AES10M10C020WB4K42	.SCREW M10	1
11	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	4946720	.ISOLATOR, VIBRATION	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015973109	15434	3094512	.SCREW, CAP, HEXAGON	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015967786	15434	4095839	M10X1.50X40 .SCREW, CAP, HEXAGON	1
14	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	4944972	.CLIP	2
15	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	C6150816920	.SPACER, COOLER SUPPORT	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	C0143500855	.SCREW, CAP, HEXAGON	1
17	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	4944970	.CLIP	1
18	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	4944976	.SPACER, MOUNTING	1
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015966633	15434	C0143500835	.SCREW, CAP, HEXAGON	1
20	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	4944968	.SPACER, MOUNTING	1
21	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	4944961	.CLIP	7
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015100796	0B8S3	C0143500814	.SCREW, CAP, HEXAGON	4
23	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	3864014	M8X1.25X14 .SPACER, MOUNTING	1
24	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	4933756	.PLATE, CLAMPING	1
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	C0143500816	.SCREW, CAP, HEXAGON	1
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	C0143500830	.SCREW, CAP, HEXAGON	1
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015967805	15434	C0143500825	.SCREW, CAP, HEXAGON	1
28	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	3864473	.SPACER, MOUNTING	1
								END OF FIGURE	





FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
ENGINE ECM SENSORS REPAIR PARTS LIST

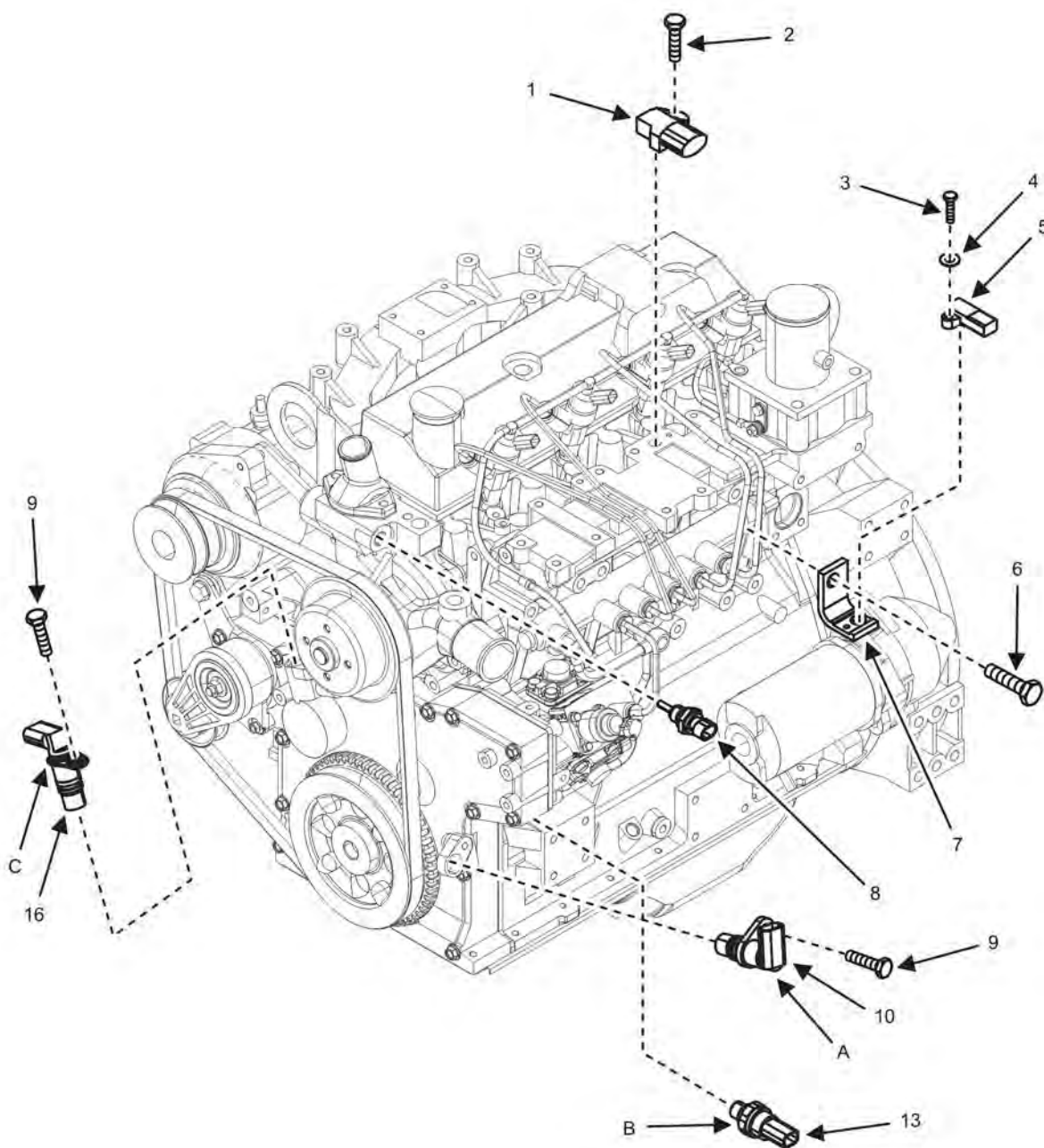


Figure 51. Engine ECM Sensors (Sheet 1 of 2).

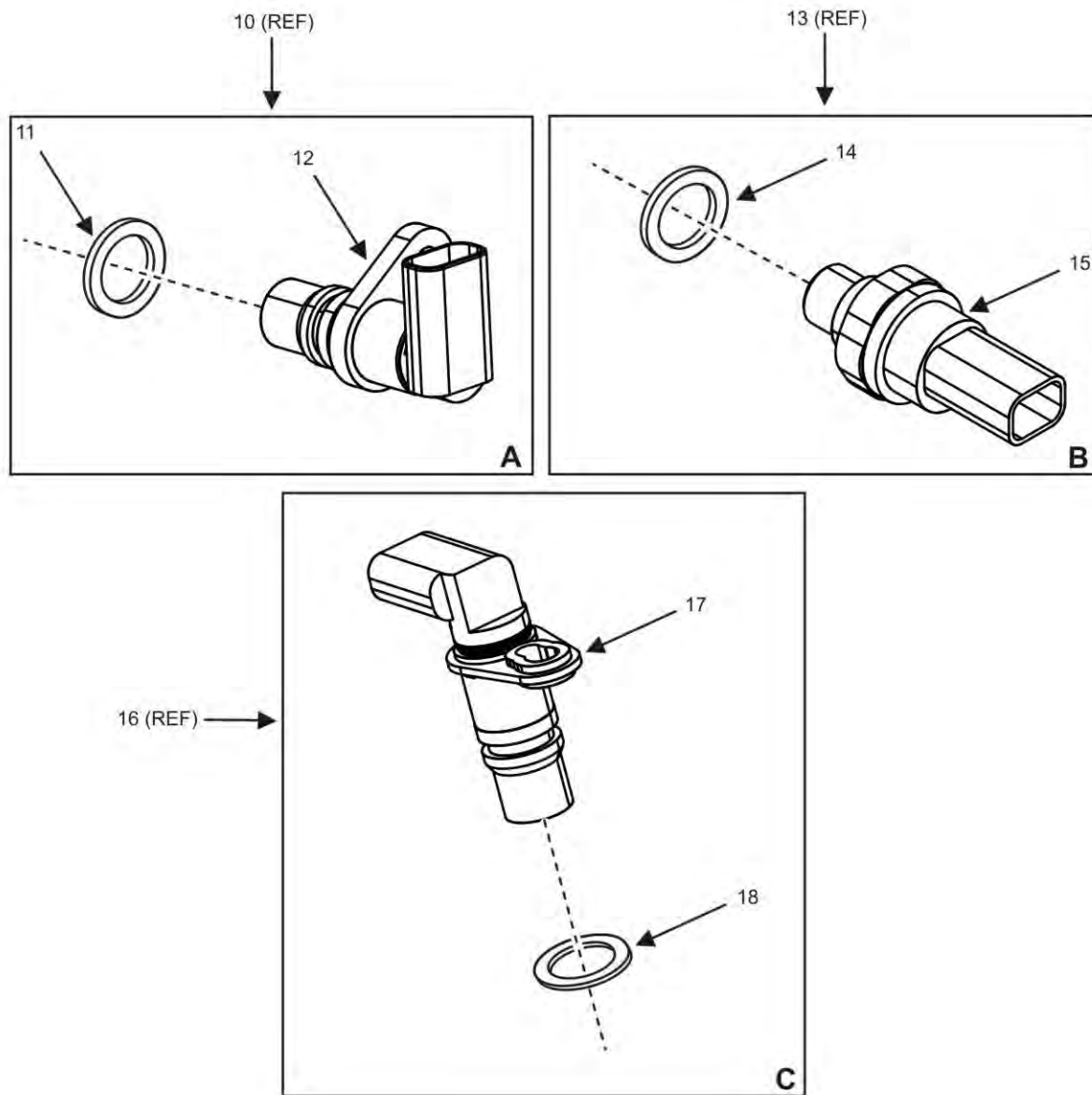


Figure 51. Engine ECM Sensors (Sheet 2 of 2).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 090221	
								FIG. 51 ENGINE ECM SENSORS	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	4944845	.SENSOR, PRESSURE AND TEMPERATURE, INTAKE	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	3864469	.SCREW, CAP, SOCKET HEAD	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	4944979	.SCREW, CAP, HEXAGON HEAD	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	4944981	.WASHER, FLAT	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	4944843	.SENSOR, AIR PRESSURE	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	C0143501016	.SCREW, CAP, HEXAGON HEAD	1
7	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	4941178	.SUPPORT, ENGINE CONTROL MODULE	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6685-01-535-4250	15434	4954905	.SENSOR, COOLANT TEMPERATURE	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	C0143500820	.SCREW, CAP, HEXAGON	2
10	PAFFF	PAFFF	PAFFF	PAFFF	2990015564239	15434	4921686	.SENSOR, CRANKSHAFT POSITION	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5331015635629	15434	4928599	..O-RING	1
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2990015669773	36MV0	4921685	..SENSOR, POSITION	1
13	PAFFF	PAFFF	PAFFF	PAFFF	5930-01-508-3767	0B8S3	4076930	.SWITCH, OIL PRESSURE	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5331015357774	15434	4921574	..O-RING	1
15	XBFZZ	XBFZZ	XBFZZ	XBFZZ	5930015083767	0B8S3	4076931	..SWITCH, OIL PRESSURE	1
16	PAFFF	PAFFF	PAFFF	PAFFF	2990015564240	15434	4921684	.SENSOR, CAMSHAFT POSITION	1
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2990015669774	36MV0	4921687	..SENSOR, POSITION	1
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5331015635629	15434	4928599	..O-RING	1
								END OF FIGURE	



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**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
CYLINDER HEAD ASSEMBLY REPAIR PARTS LIST**

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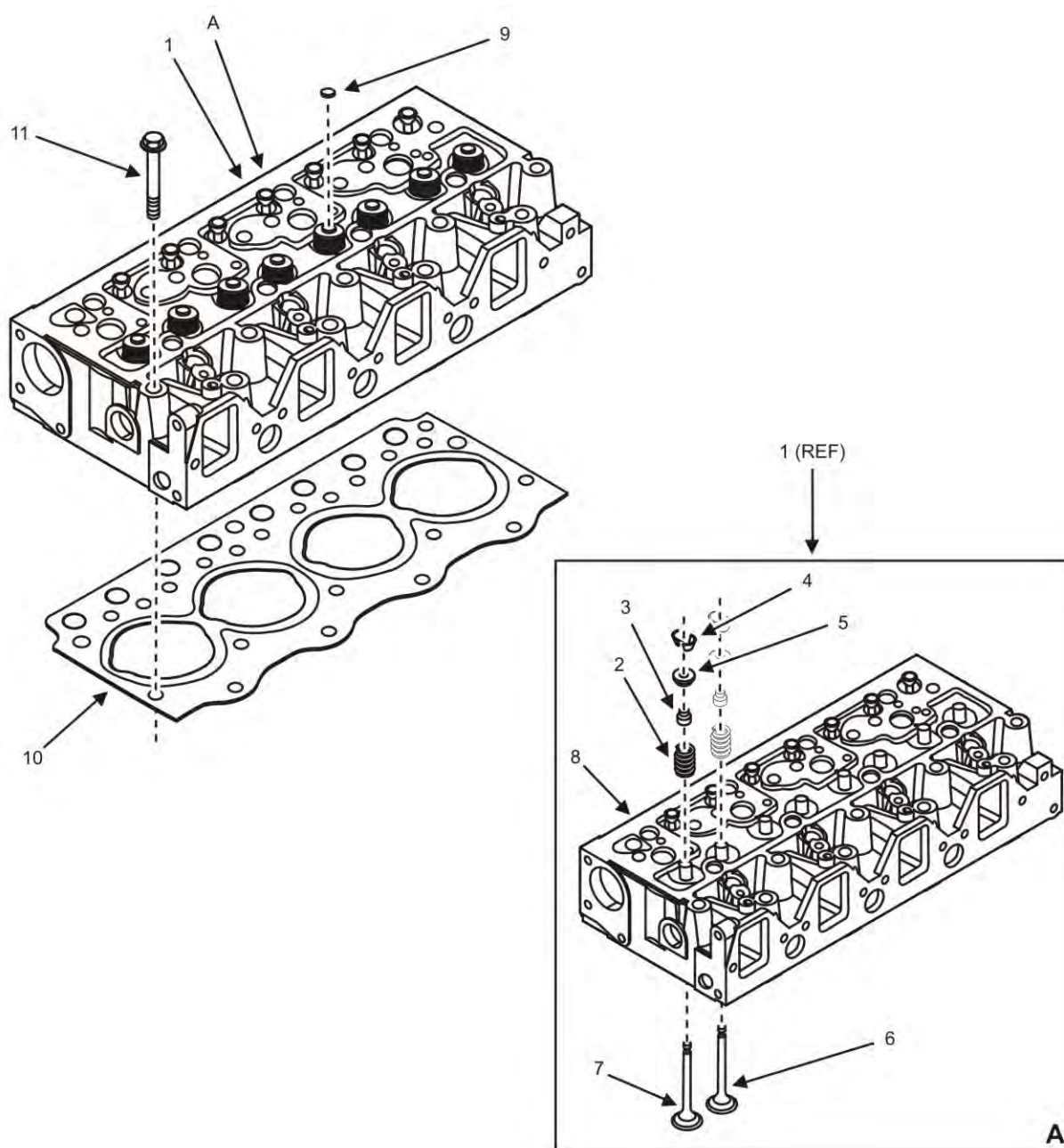


Figure 52. Cylinder Head Assembly.

(1) ITEM NO.	ARMY	(2) SMR CODE AIR USMC FORCE	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
							GROUP 090222	
							FIG. 52. CYLINDER HEAD ASSEMBLY	
1	PAFHH	PAFHH	PAFFF	PAFFF		15434 4944247	.HEAD, CYLINDER	1
2	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5360015091588	15434 C6204414410	..SPRING, VALVE	8
3	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5330015090465	15434 C6204414541	..SEAL, VALVE STEM	8
4	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5340015966641	15434 C6204414510	..RETAINER, VALVE SPRING	8
5	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5315015090877	15434 C6204414520	..COLLET, VALVE	16
6	PAHZZ	PAHZZ	PAFZZ	PAFZZ	4820015959185	15434 C6209414210	..VALVE, EXHAUST	4
7	PAHZZ	PAHZZ	PAFZZ	PAFZZ	2815015959429	15434 C6207414130	..VALVE, INTAKE	4
8	XAHZZ	XAHZZ	XAFZZ	XAFZZ		15434 4941107	..HEAD, CYLINDER	1
9	PAHZZ	PAHZZ	PAFZZ	PAFZZ		15434 C6204414550	.CAP, VALVE	8
10	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5330015967820	15434 C6204111840	.GASKET, CYLINDER HEAD	1
11	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5305015090458	15434 C6204131610	.SCREW, HEX FLANGE HEAD CAP	17
							END OF FIGURE	





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**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
VALVE COVER REPAIR PARTS LIST**

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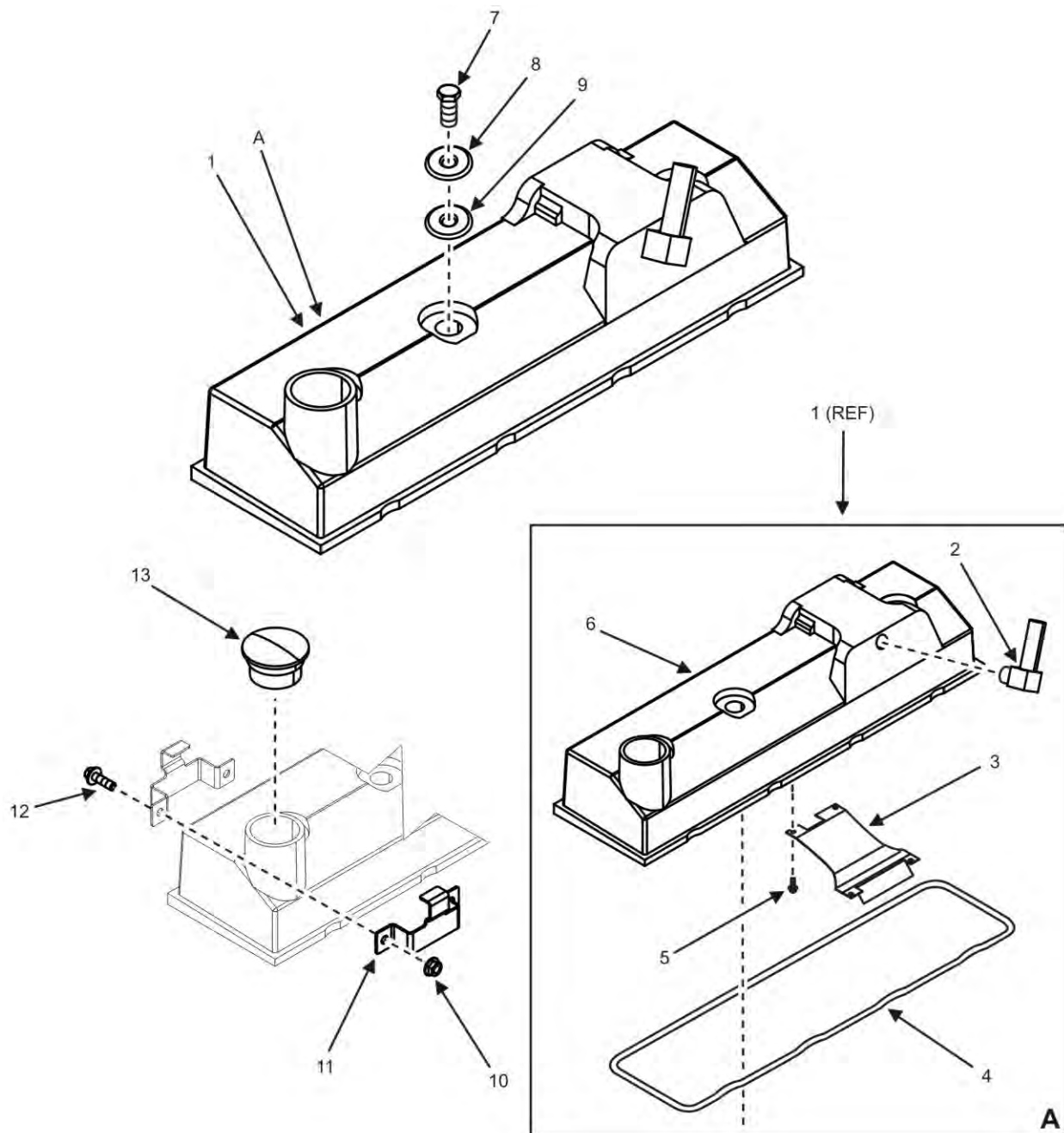


Figure 53. Valve Cover.

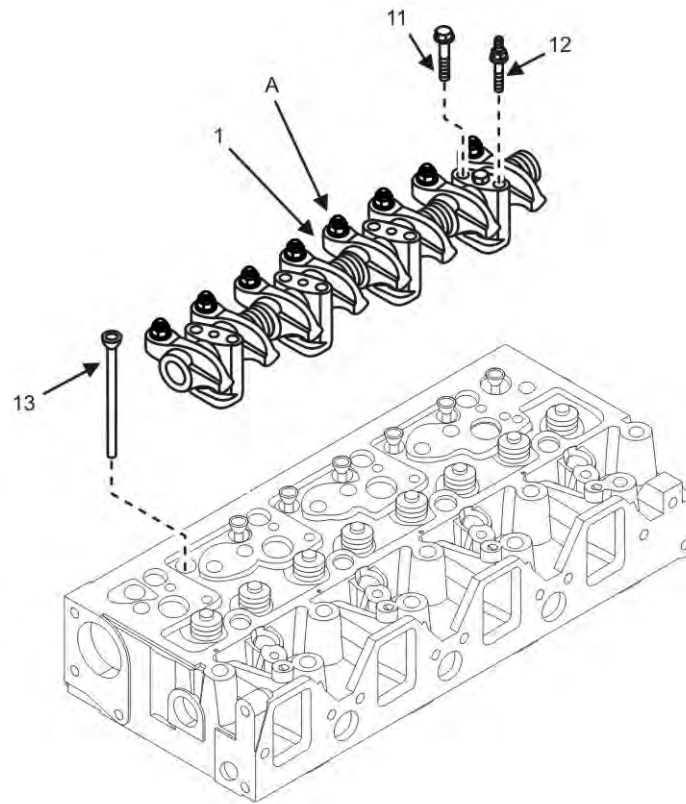
(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 09022201	
								FIG. 53. VALVE COVER	
1	PAFFF	PAFFF	PAFFF	PAFFF		15434	4941169	.COVER, VALVE	1
2	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	4944866	..TUBE, BREATHER	1
3	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	4944469	..PLATE, COVER	1
4	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5330015090466	15434	C6204118810	..SEAL, O-RING	1
5	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	C0441802550	..RIVET	4
6	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	4941170	..COVER, VALVE	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015098762	15434	C6136118120	..NUT, LOCK	3
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015098766	15434	C6136118130	.WASHER, PLAIN	3
9	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5365015098760	15434	C6136118142	.GASKET, VALVE COVER	3
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	.NUT, HEX FLANGE M6 x 1	2
11	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21067	.BRACKET, CRANK VENT	2
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015921168	44940	AES10M06A020WBK42	.SCREW, HEX FLANGE HEAD M6 x 1 X 20	2
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2590015099115	15434	C6204118610	.CAP, FILLER OPENING	1
								END OF FIGURE	



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**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**ROCKER ARMS AND PUSH RODS REPAIR PARTS LIST**

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**Figure 54. Rocker Arms and Push Rods (Sheet 1 of 2).**

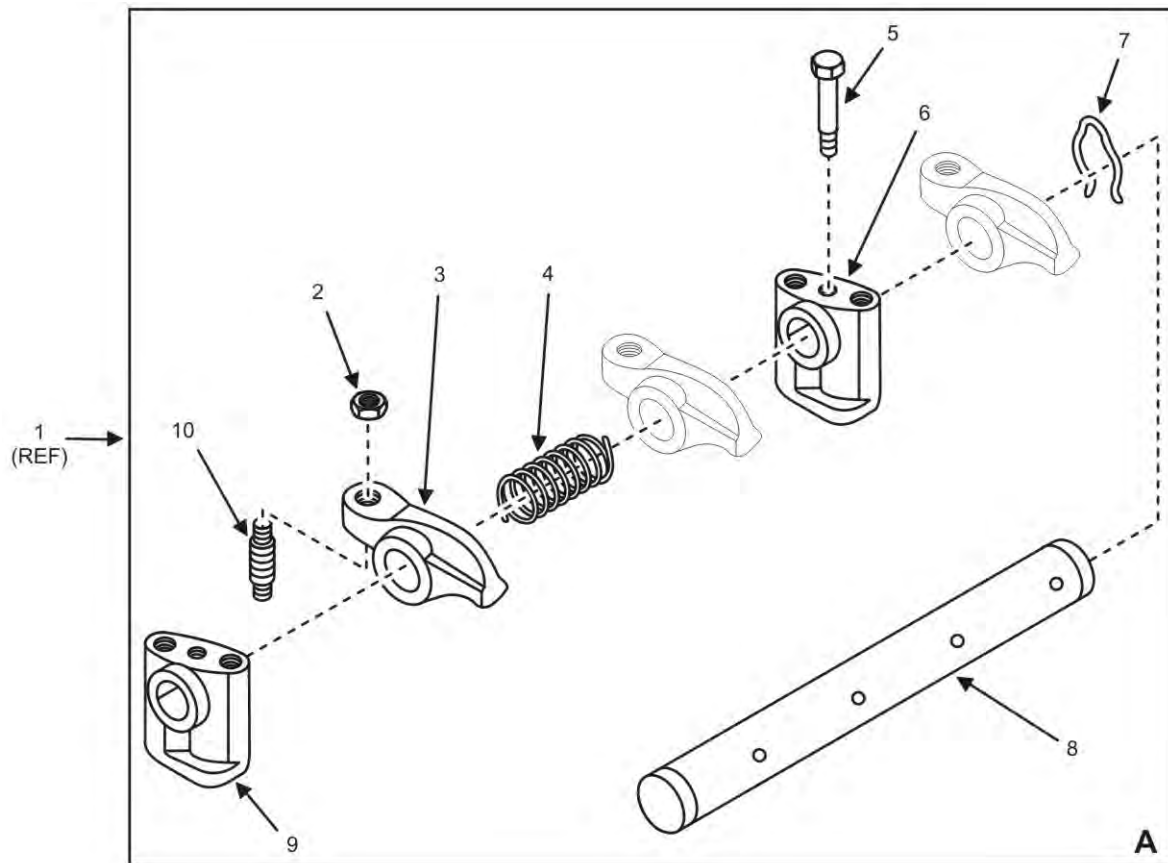


Figure 54. Rocker Arms and Push Rods (Sheet 2 of 2).

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 09022202	
								FIG. 54. ROCKER ARMS AND PUSH RODS	
1	PAFHH	PAFHH	PAFZZ	PAFZZ		15434	C6205435300	.LEVER, ROCKER	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015091246	15434	C6221415420	..NUT, LOCK	8
3	PAHZZ	PAHZZ	PAFZZ	PAFZZ	6610015955704	15434	C6205435410	..LEVER, ROCKER	8
4	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5360015098768	15434	C6202435320	..SPRING, COMPRESSION	3
5	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5305015964677	15434	C6205435310	..SCREW, HEX FLANGE HEAD CAP	1
6	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5340015090500	15434	C6204415110	..SUPPORT, ROCKER LEVER	1
7	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5340015090503	15434	C6204415620	..CLIP	2
8	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3040015967813	15434	C6205435500	..SHAFT, ROCKER LEVER	1
9	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5340015090502	15434	C6204415120	..SUPPORT, ROCKER LEVER	3
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015090890	15434	C6221415410	..SCREW, ROCKER LEVER ADJUSTING	8
11	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5305015102843	15434	C0143500865	.SCREW, HEX FLANGE HEAD CAP	5
12	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5305015090459	15434	C6204415710	.SCREW, HEX FLANGE HEAD CAP	3
13	PAHZZ	PAHZZ	PAFZZ	PAFZZ	2815015090479	15434	C6204413110	.ROD, PUSH	8
END OF FIGURE									

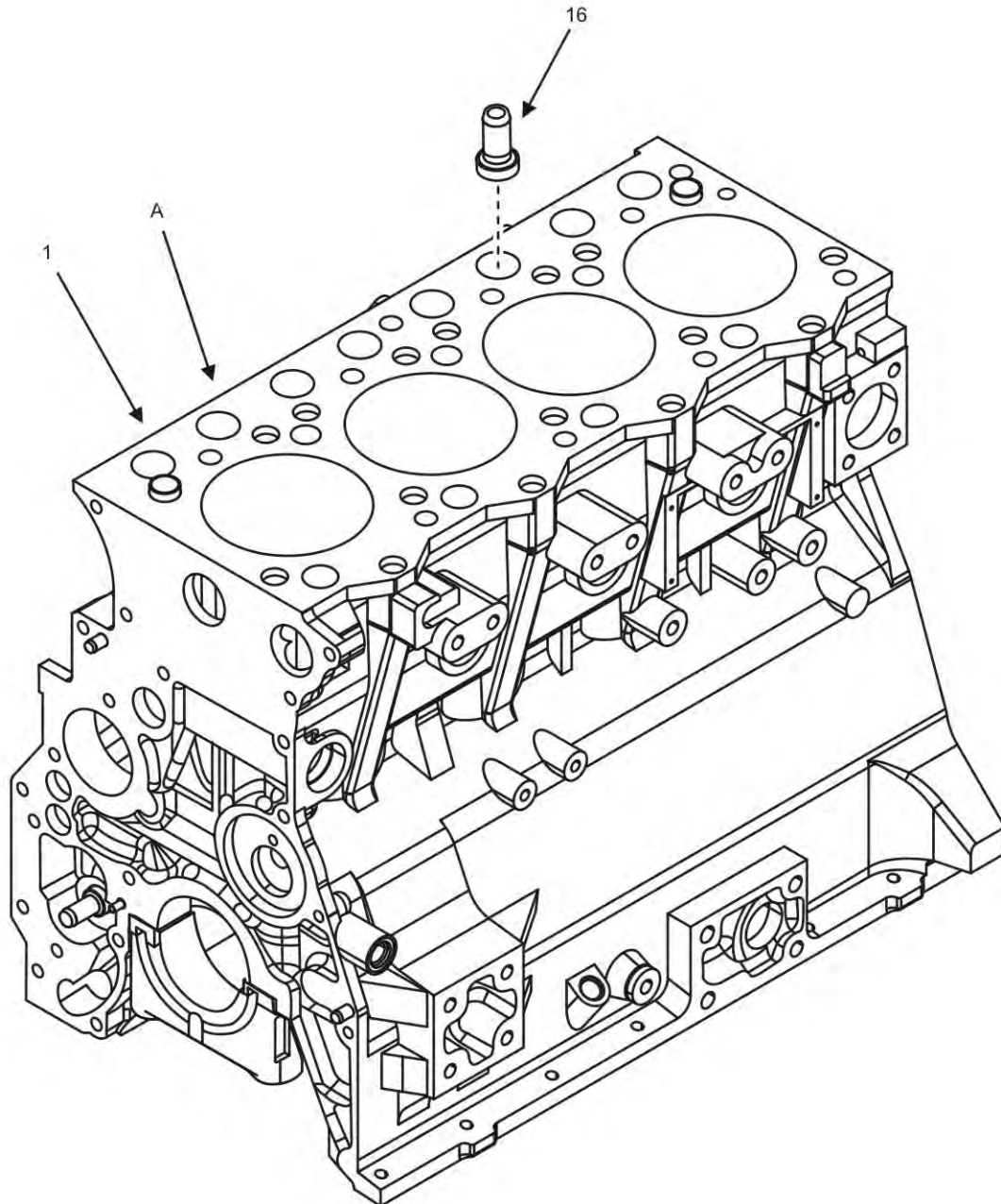




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**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**SHORT BLOCK ASSEMBLY REPAIR PARTS LIST**

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**Figure 55. Short Block Assembly (Sheet 1 of 2).**

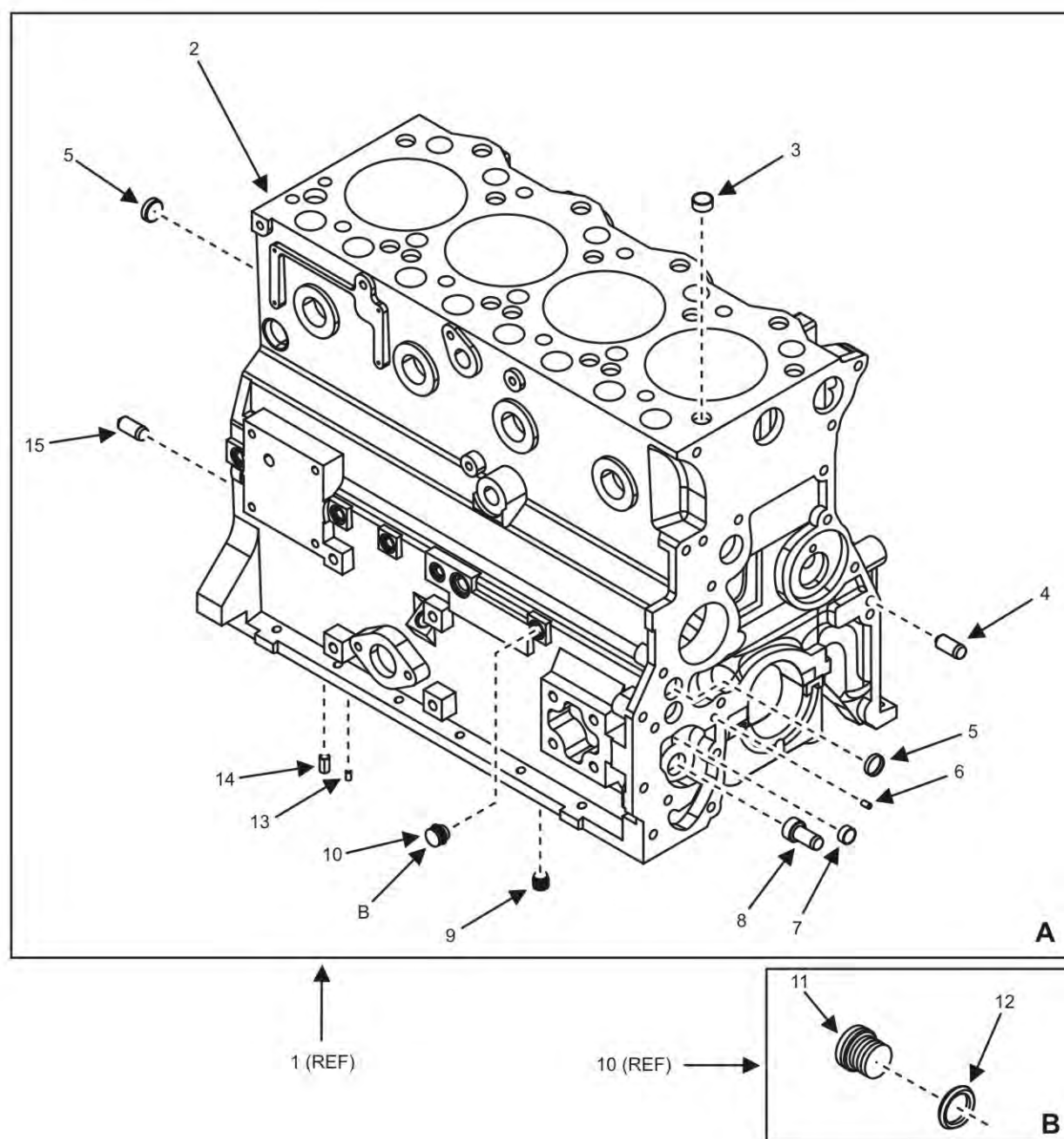


Figure 55. Short Block Assembly (Sheet 2 of 2).

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 090223	
								FIG. 55 SHORT BLOCK ASSEMBLY.	
1	XAHHH	XAHHH	XAFF	XAFF		15434	4941114	..BLOCK, CYLINDER	1
2	PAHZZ	PAHZZ	PAFZZ	PAFZZ	2815015959480	15434	4941115	..BLOCK, CYLINDER	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5315015966490	15434	C6140211130	PIN, DOWEL	2
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	C0402000820	..PIN, GUIDE	2
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015097937	0B8S3	3093782	..PLUG, EXPANSION	4
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	C6136521620	..PIN, DOWEL	1
7	PAHZZ	PAHZZ	PAFZZ	PAFZZ	4730015972886	15434	C6204511711	..BUSHING	1
8	PAHZZ	PAHZZ	PAFZZ	PAFZZ		15434	C6204511620	..SHAFT, LUBE OIL PUMP	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015092572	15434	C0704270312	..PLUG, PIPE	1
10	PAFFF	PAFFF	PAFFF	PAFFF	5365014545474	15434	3678923	..PLUG, THREADED	5
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5365015897359	15434	3678924	...PLUG, THREADED	1
12	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5331014812514	15434	3678925	..SEAL, O-RING	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5315015967816	15434	C6207211190	..DOWEL, PIN	4
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	C0402500408	..PIN, ROLL	6
15	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	C0402001228	..PIN, GUIDE	2
16	PAHZZ	PAHZZ	PAFZZ	PAFZZ	2815015090452	15434	C6204412110	..TAPPET, VALVE	8
17	KFFFF	KFFFF	KFFFF	KFFFF		15434	4955996	..SET, OVERHAUL GASKET (NOT SHOWN).	1
								END OF FIGURE	



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**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
CONNECTING RODS REPAIR PARTS LIST**

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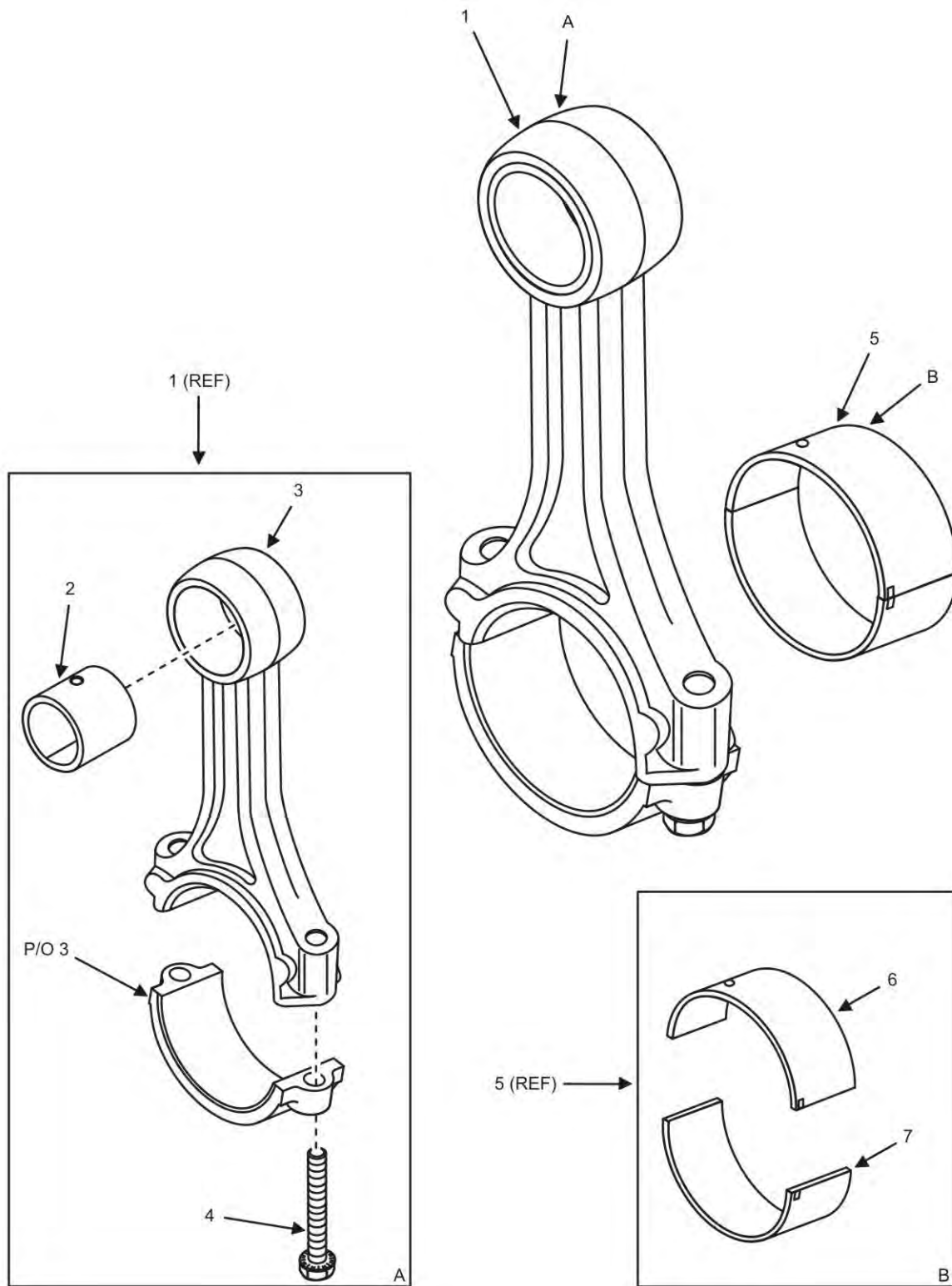


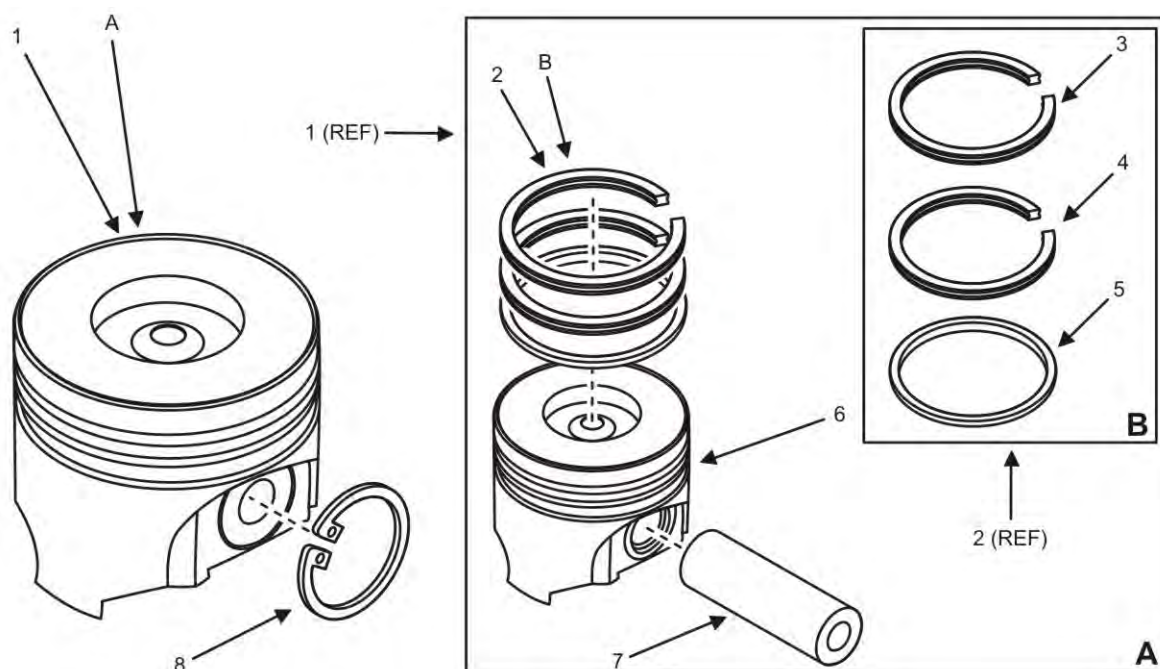
Figure 56. Connecting Rods.

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 09022301	
								FIG. 56 CONNECTING RODS	
1	PAHHH	PAHHH	PAFFF	PAFFF	2530015934686	15434	4944475	.ROD, ENGINE CONNECTING	4
2	XBHZZ	XBHZZ	XBFZZ	XBFZZ		15434	4944479	..BUSHING	1
3	XBHZZ	XBHZZ	XBFZZ	XBFZZ		15434	4944478	..ROD, ENGINE CONNECTING	1
4	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5305015964675	15434	C6204313310	..SCREW, HEX FLANGE HEAD CAP	2
5	PAHHH	PAHHH	PAFFF	PAFFF	3120015966495	15434	4944480	.BEARING, CONNECTING ROD	4
6	XAHZZ	XAHZZ	XAFZZZ	XAFZZ		15434	4944481	..BEARING, CONNECTING ROD (UPPER)	1
7	XAHZZ	XAHZZ	XAFZZZ	XAFZZ		15434	C6204313410	..BEARING, CONNECTING ROD (LOWER)	1
								<b>END OF FIGURE</b>	





**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**PISTONS REPAIR PARTS LIST**



**Figure 57. Pistons.**

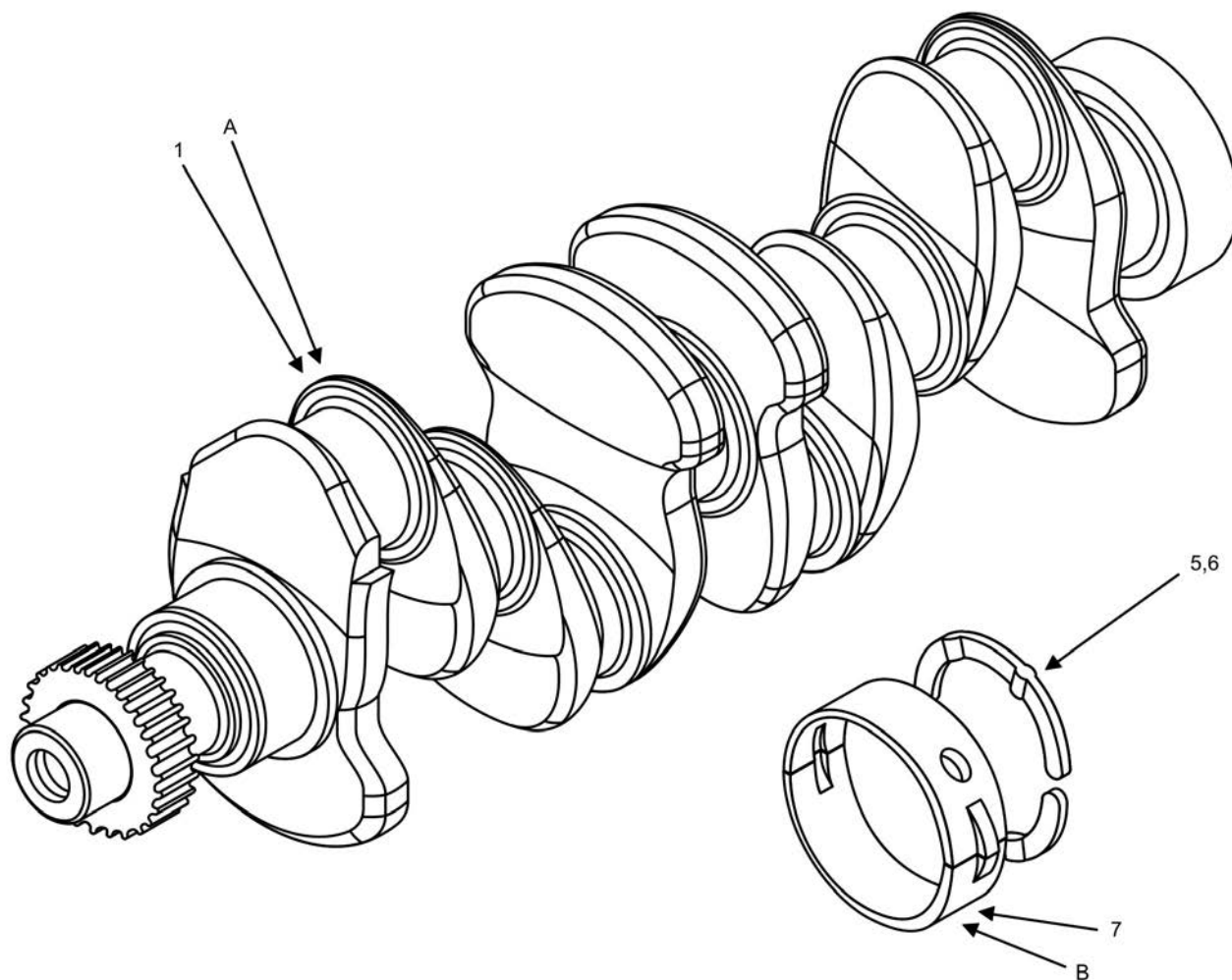
(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 09022302									
FIG. 57 PISTONS									
1	KFH HH	KFH HH	KFFF	KFFF	2815015959458	15434	4955416	.KIT, PISTON	4
2	PAH HH	PAH HH	PAFF	PAFF		15434	4941138	..SET, PISTON	
3	XBH ZZ	XBH ZZ	XBF ZZ	XBF ZZ		15434	4941140	RING	1
								...RING, COMPRESSION PISTON	1
4	XBH ZZ	XBH ZZ	XBF ZZ	XBF ZZ		15434	4945721	...RING, COMPRESSION PISTON	1
5	XBH ZZ	XBH ZZ	XBF ZZ	XBF ZZ		15434	4941141	...RING, OIL PISTON	1
6	XBH ZZ	XBH ZZ	XBF ZZ	XBF ZZ		15434	4941139	..PISTON, ENGINE	1
7	PAH ZZ	PAH ZZ	PAF ZZ	PAF ZZ	2815015959382	15434	4944443	.PIN, PISTON	4
8	PAH ZZ	PAH ZZ	PAF ZZ	PAF ZZ	5325015106068	15434	C0406503012	.RING, RETAINING	2
END OF FIGURE									



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**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**CRANKSHAFT AND CRANKSHAFT GEAR REPAIR PARTS LIST**

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**Figure 58. Crankshaft and Crankshaft Gear (Sheet 1 of 2).**

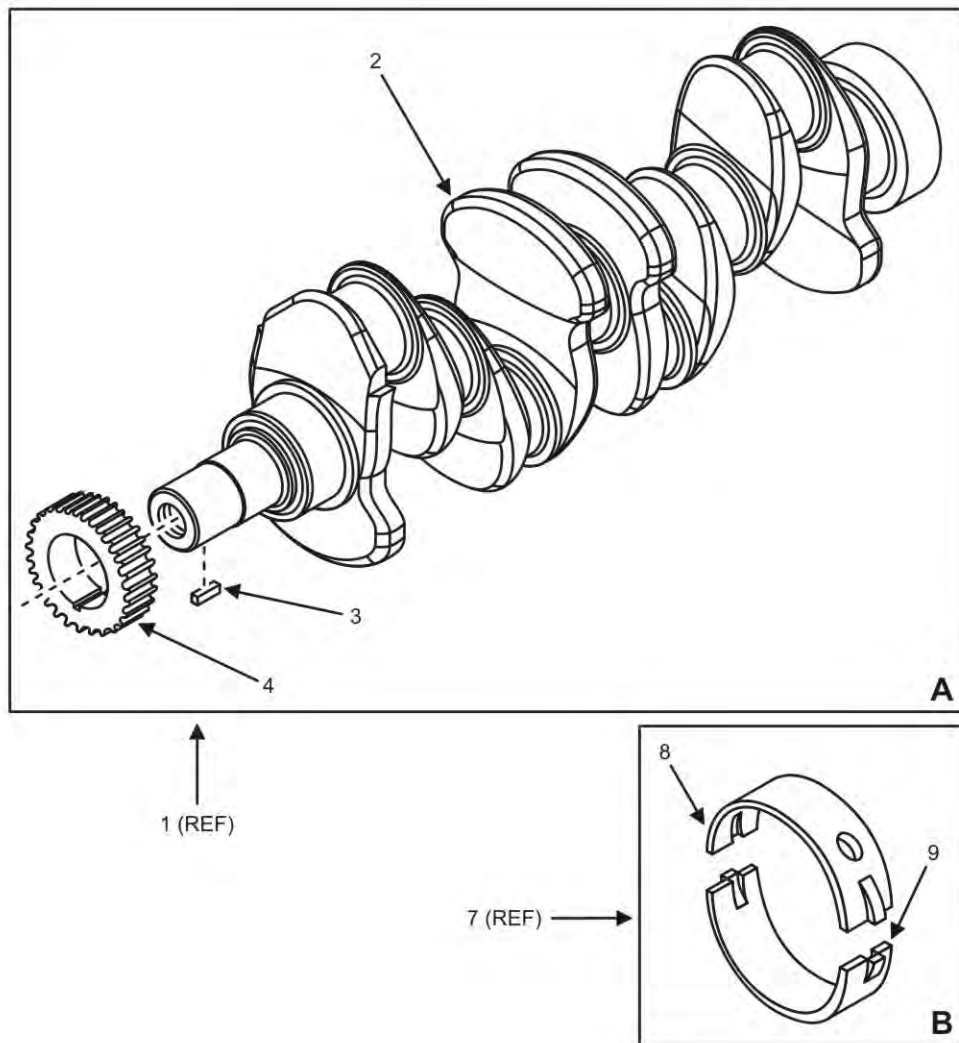


Figure 58. Crankshaft and Crankshaft Gear (Sheet 2 of 2).

(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 09022303	
								FIG. 58 CRANKSHAFT AND CRANKSHAFT GEAR	
1	PAHHH	PAHHH	PAFFF	PAFFF	2815015959416	15434	4941136	.CRANKSHAFT,	1
2	PAHZZ	PAHZZ	PAFZZ	PAFZZ		15434	4944438	..CRANKSHAFT, ENGINE	1
3	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5315015967815	15434	C6206311530	..KEY, PLAIN WOODRUFF	1
4	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3020015967798	15434	4941137	..GEAR, CRANKSHAFT	1
5	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3120015967818	15434	C6204218510	.BEARING, THRUST	3
6	PAHHH	PAHHH	PAFFF	PAFFF	3120015967814	15434	C6204218500	..THRUST BEARING	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3120015966630	15434	C6204218100	...BEARING, MAIN	5
8	PAHZZ	PAHZZ	XBFZZ	XBFZZ		15434	C6204218110	...BEARING, MAIN (UPPER)	1
9	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3120015967822	15434	C6204218120	...BEARING, MAIN (LOWER	1
10	KFH HH	KFH HH	KFFFF	KFFFF	3120015089060	15434	3800872	.SET, MAIN BEARING (NOT SHOWN)	1
								END OF FIGURE	



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**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
FRONT GEAR CASE COVER REPAIR PARTS LIST**

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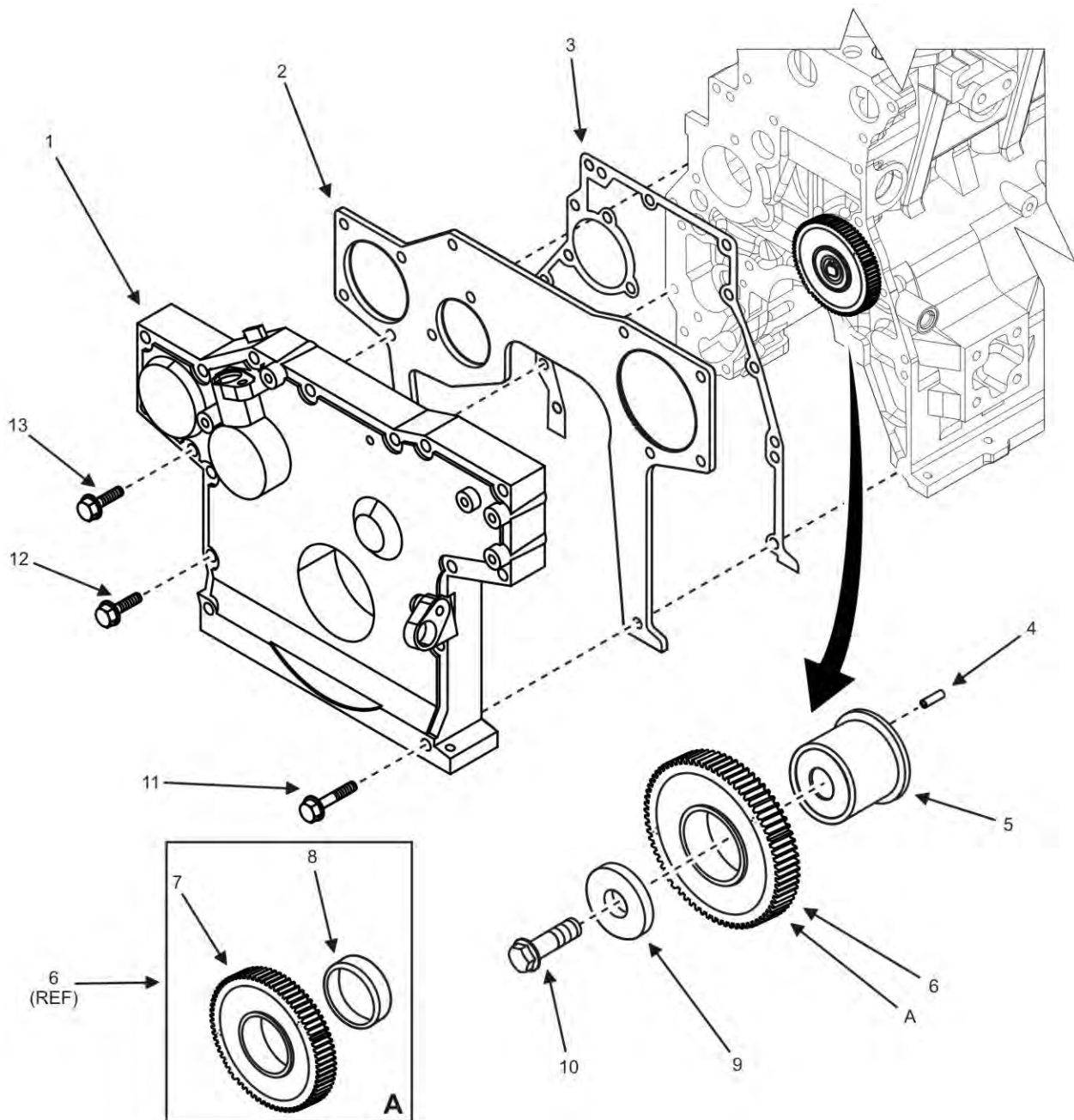


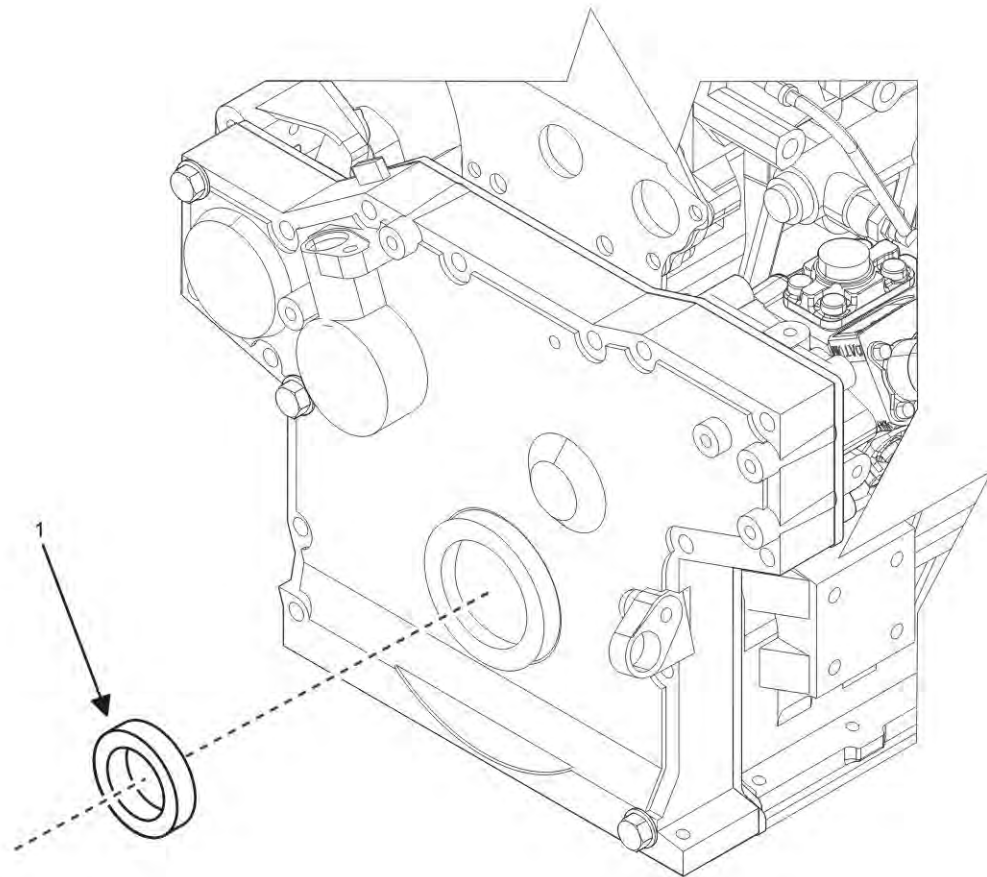
Figure 59. Front Gear Case Cover.



(1)	(2)				(3)	(4)		(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N		DESCRIPTION AND UOC	QTY.
									GROUP 09022304	
									FIG. 59. FRONT GEAR CASE COVER.	
1	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	4941133		.COVER, FRONT	1
2	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	4941134		.PLATE, COVER	1
3	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5330015092599	0B8S3	C6206213840		.GASKET	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5315015106191	0B8S3	C0402500512		.PIN, SPRING	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3040015090456	0B8S3	C6204316331		.SHAFT, STRAIGHT	1
6	PAFFF	PAFFF	PAFFF	PAFFF	3020015967799	15434	4941142		.GEAR, IDLER	1
7	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	4941190		..GEAR, IDLER	1
8	XBFZZ	XBFZZ	XBFZZ	XBFZZ			4944998		..BUSHING	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015090464	0B8S3	C6204316350		.WASHER, FLAT	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	C0143500816		.SCREW, CAP, HEXAGON HEAD	2
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	4944458		.SCREW, HEX FLANGE HEAD CAP	3
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	C0143500855		.SCREW, HEX FLANGE HEAD	6
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015096083	15434	C0143500860		.SCREW, HEX FLANGE HEAD CAP	8
									END OF FIGURE	



**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**FRONT CRANKSHAFT OIL SEAL REPAIR PARTS LIST**

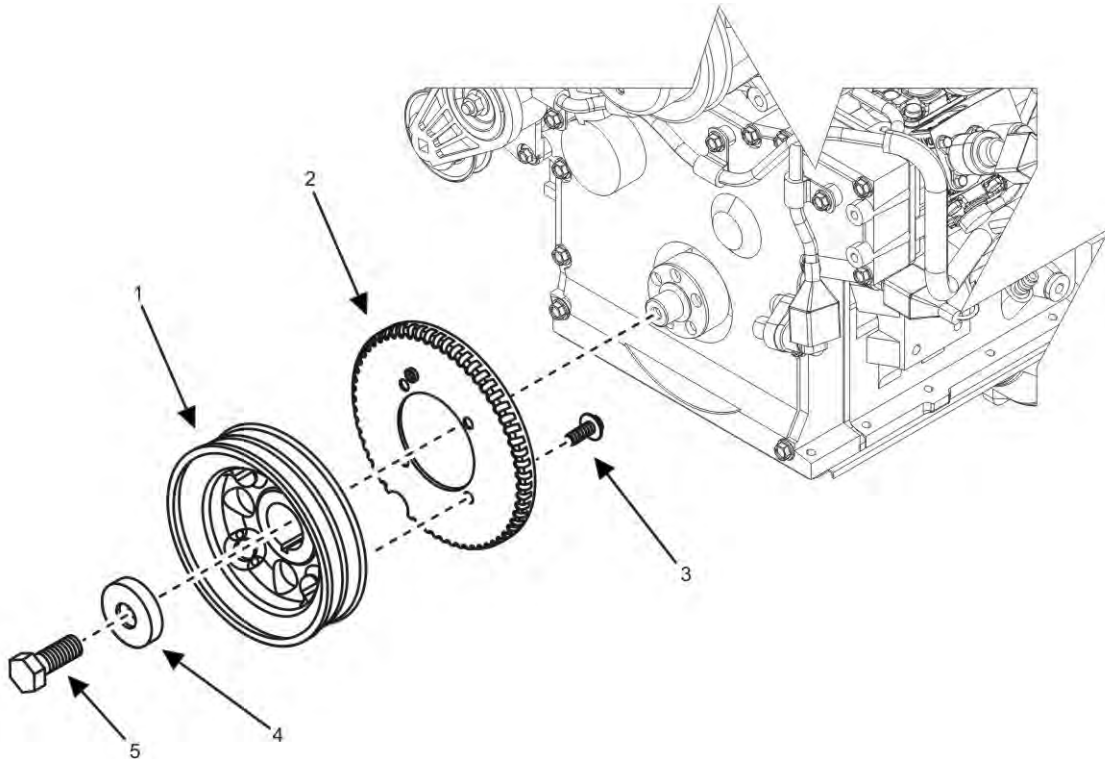


**Figure 60. Front Crankshaft Oil Seal.**

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 09022305									
FIG. 60 FRONT CRANKSHAFT OIL SEAL									
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015090463	15434	C6204213510	.SEAL, OIL	1
END OF FIGURE									



**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**CRANKSHAFT PULLEY REPAIR PARTS LIST**



**Figure 61. Crankshaft Pulley.**

(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 09022306									
FIG. 61 CRANKSHAFT PULLEY									
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ	3020015959538	15434	4944539	.PULLEY, CRANKSHAFT	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2815015954680	15434	4941179	.RING, SPEED INDICTOR	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015964658	15434	C0143500812	.SCREW, HEX FLANGE HEAD CAP	4
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015967823	15434	C6136311431	.PLATE, CLAMPING	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015966500	15434	C0105031845	.SCREW, HEX FLANGE HEAD CAP	1
END OF FIGURE									



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**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
CAMSHAFT AND GEAR REPAIR PARTS LIST**

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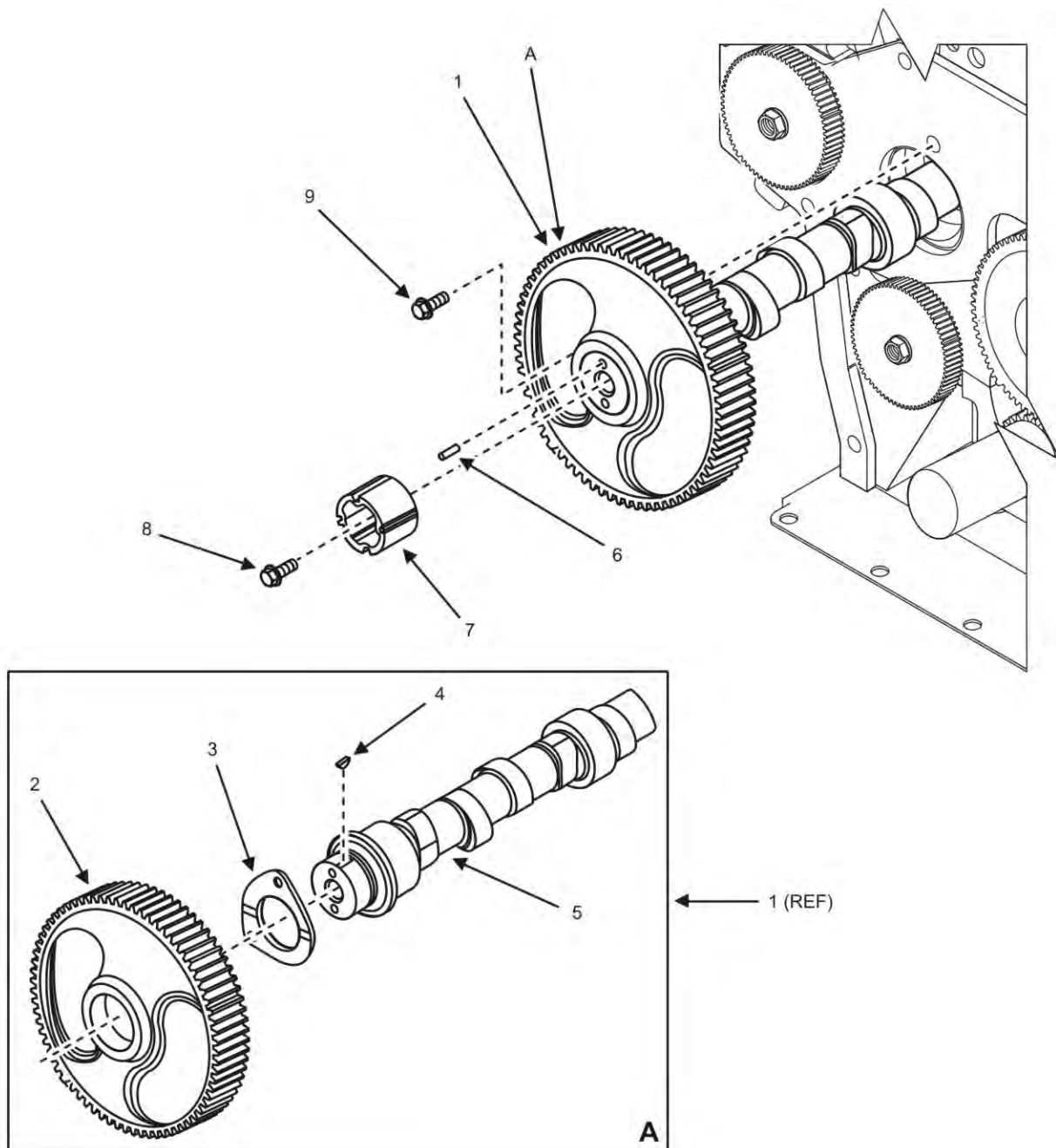


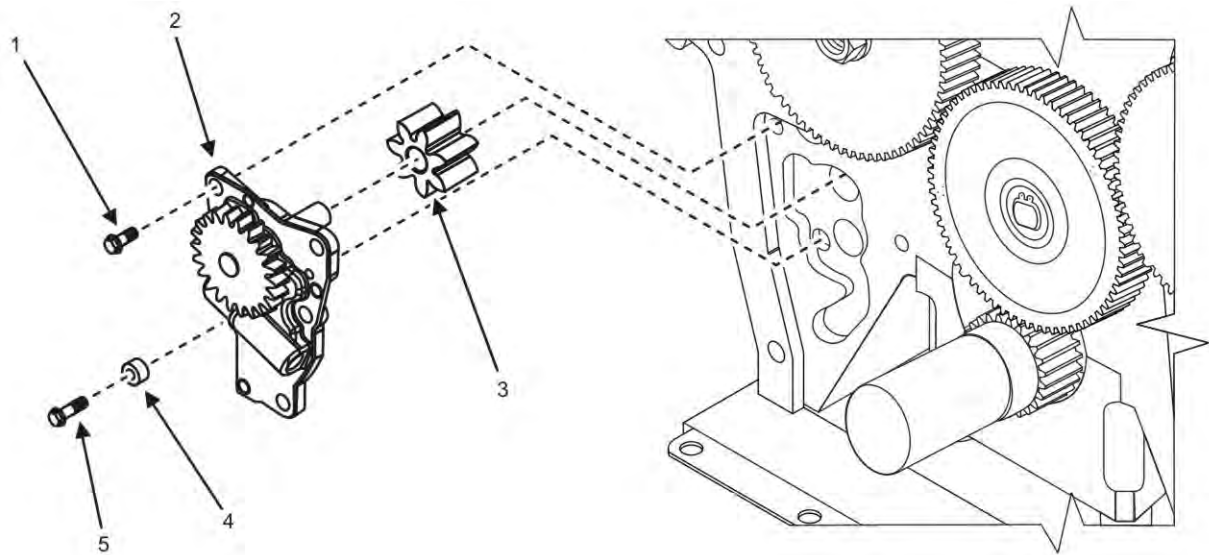
Figure 62. Camshaft and Gear.



(1)	(2)			(3)	(4)	(5)	(6)	(7)	
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 09022307	
								FIG. 62 CAMSHAFT AND GEAR	
1	PAHHH	PAHHH	PAFFF	PAFFF	2815015958952	15434	4941146	.CAMSHAFT AND GEAR	1
2	PAHZZ	PAHZZ	PAFZZ	PAFZZ	3020015967800	15434	4941145	..GEAR, CAMSHAFT	1
3	PAHZZ	PAHZZ	PAFZZ	PAFZZ		15434	C6204411131	..PLATE, CLAMPING	1
4	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5315015967810	15434	C0401000516	..KEY, RECTANGULAR	1
5	PAHZZ	PAHZZ	PAFZZ	PAFZZ	2815015959226	15434	4941147	..CAMSHAFT	1
6	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5315015967793	15434	4944992	.PIN, ROLL	2
7	PAHZZ	PAHZZ	PAFZZ	PAFZZ	6120015955747	15434	4941144	.ADAPTER, POSITION SENSOR	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	C0143501025	.SCREW, HEX FLANGE HEAD CAP	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	C0143500820	.SCREW,HEX FLANGE HEAD CAP	2
								END OF FIGURE	



**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**OIL PUMP REPAIR PARTS LIST**



**Figure 63. Oil Pump.**

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 09022308									
FIG. 63 OIL PUMP									
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		15434	C0143500816	.SCREW, HEX FLANGE HEAD CAP	4
2	PAHZZ	PAHZZ	PAFZZ	PAFZZ	4320015939606	15434	4941148	.PUMP, LUBRICATING OIL	1
3	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5365015091248	15434	C6207511610	.GEAR, LUBE OIL PUMP	1
4	PAHZZ	PAHZZ	PAFZZ	PAFZZ	5365015091248	15434	C6691418230	.SPACER, MOUNTING	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015967805	15434	C0143500825	.SCREW, HEX FLANGE HEAD CAP	1
END OF FIGURE									



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**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
FLYWHEEL AND FLYWHEEL HOUSING REPAIR PARTS LIST**

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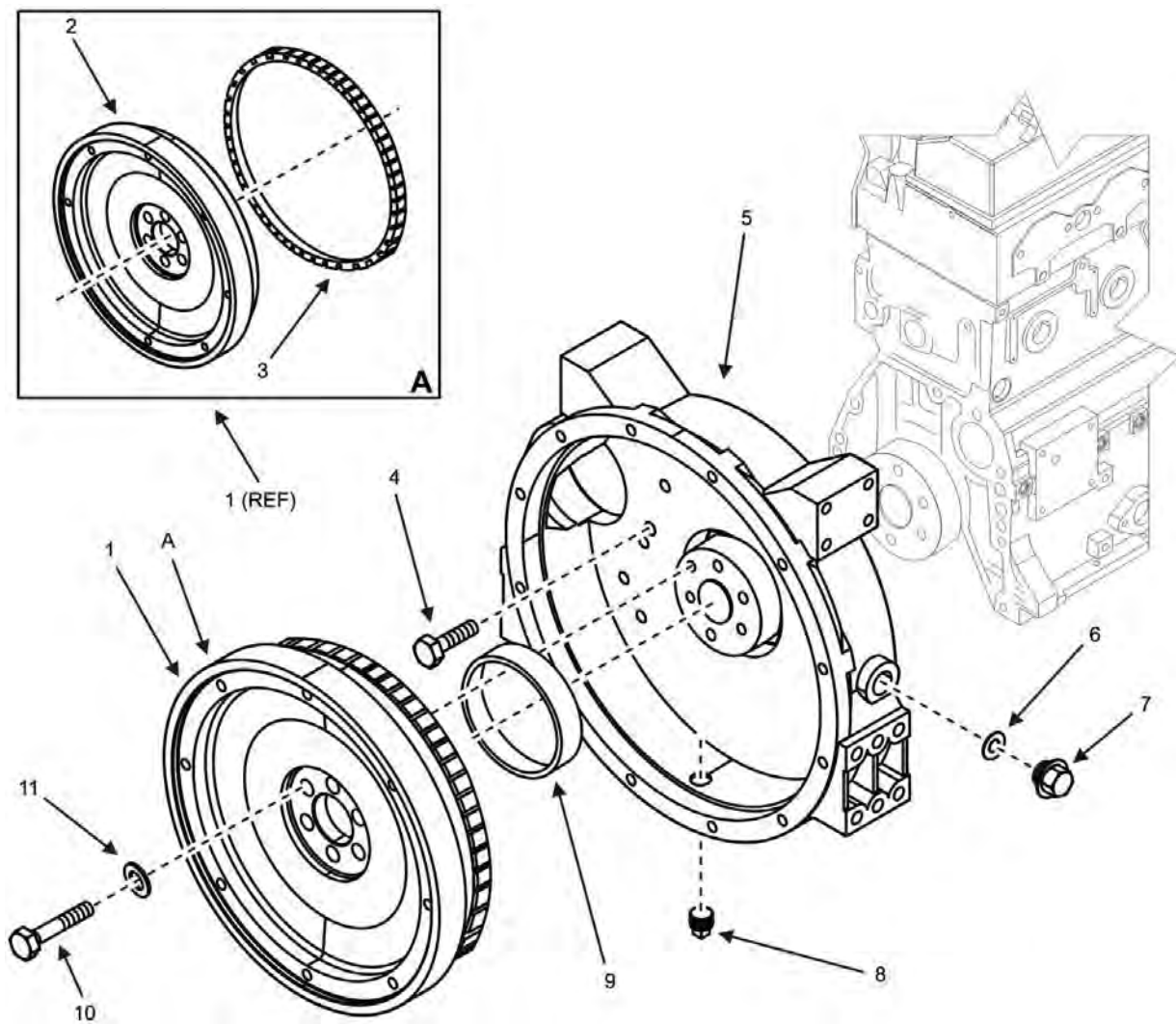


Figure 64. Flywheel and Flywheel Housing.

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 09022309	
								FIG. 64 FLYWHEEL AND FLYWHEEL HOUSING.	
1	PAFHH	PAFHH	PAFHH	PAFHH	2815015090482	15434	C6204314510	.FLYWHEEL	1
2	PAHZZ	PAHZZ	PAHZZ	PAHZZ		15434	C6204314193	..GEAR, FLYWHEEL RING	1
3	PAHZZ	PAHZZ	PAHZZ	PAHZZ		15434	C6204314520	..FLYWHEEL	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015091582	15434	3925344	.SCREW, HEX	
5	XBFZZ	XBFZZ	XBFZZ	XBFZZ		15434	C6204214230	FLANGE HEAD CAP .HOUSING, FLYWHEEL	11
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015097933	15434	3093844	.WASHER, SEALING	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015091596	15434	C6204215180	.PLUG, THREADED	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015092573	15434	C0704200415	.PIPE PLUG	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5330015100104	15434	C6140211341	.SEAL, OIL	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015100865	15434	C0105061430	.SCREW, HEX	
								FLANGE HEAD CAP	6
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015098383	15434	C6130321361	.WASHER, PLAIN	6
								END OF FIGURE	





**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**ENGINE WIRING HARNESS REPAIR PARTS LIST**

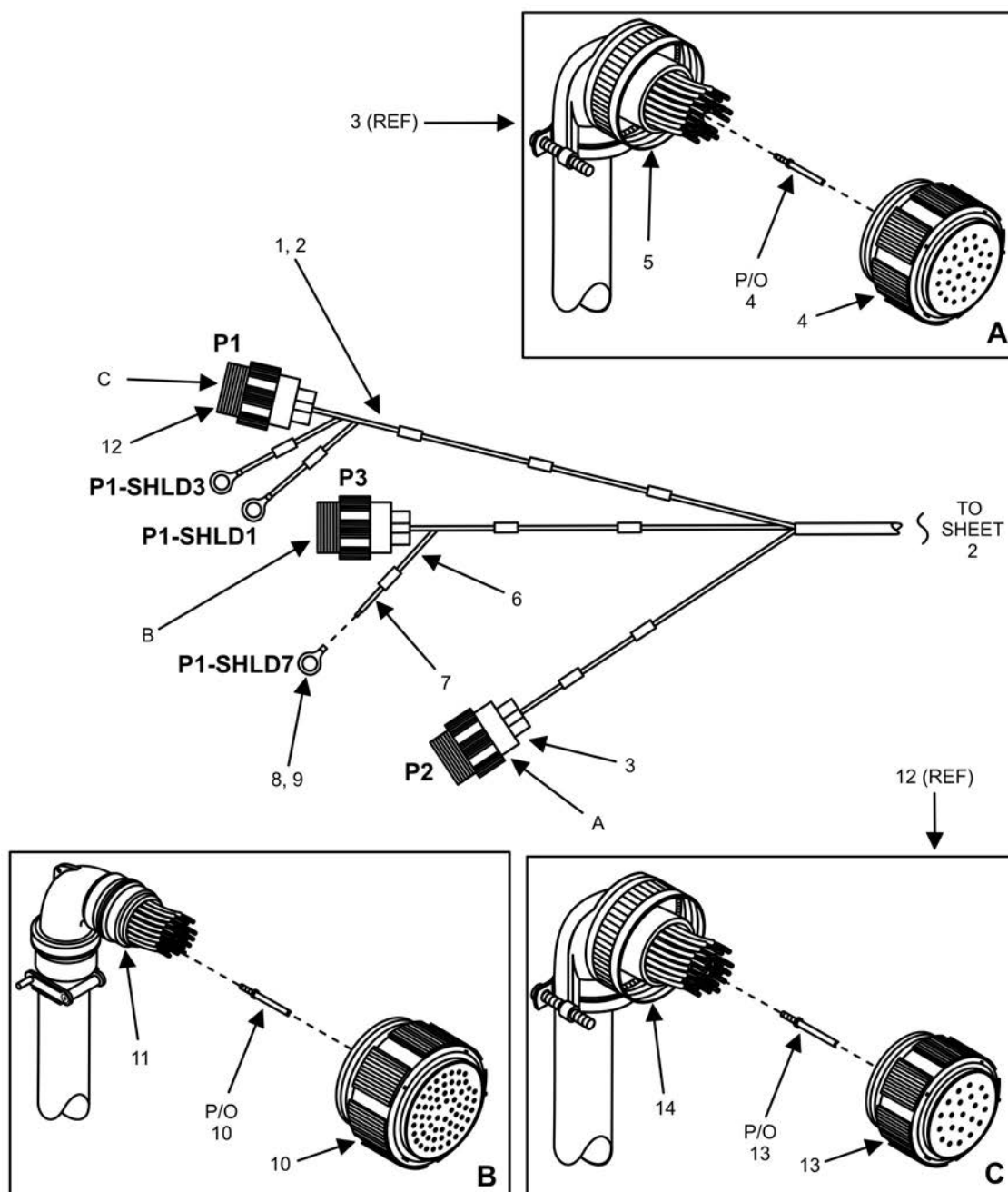


Figure 65. Engine Wiring Harness (Sheet 1 of 19).

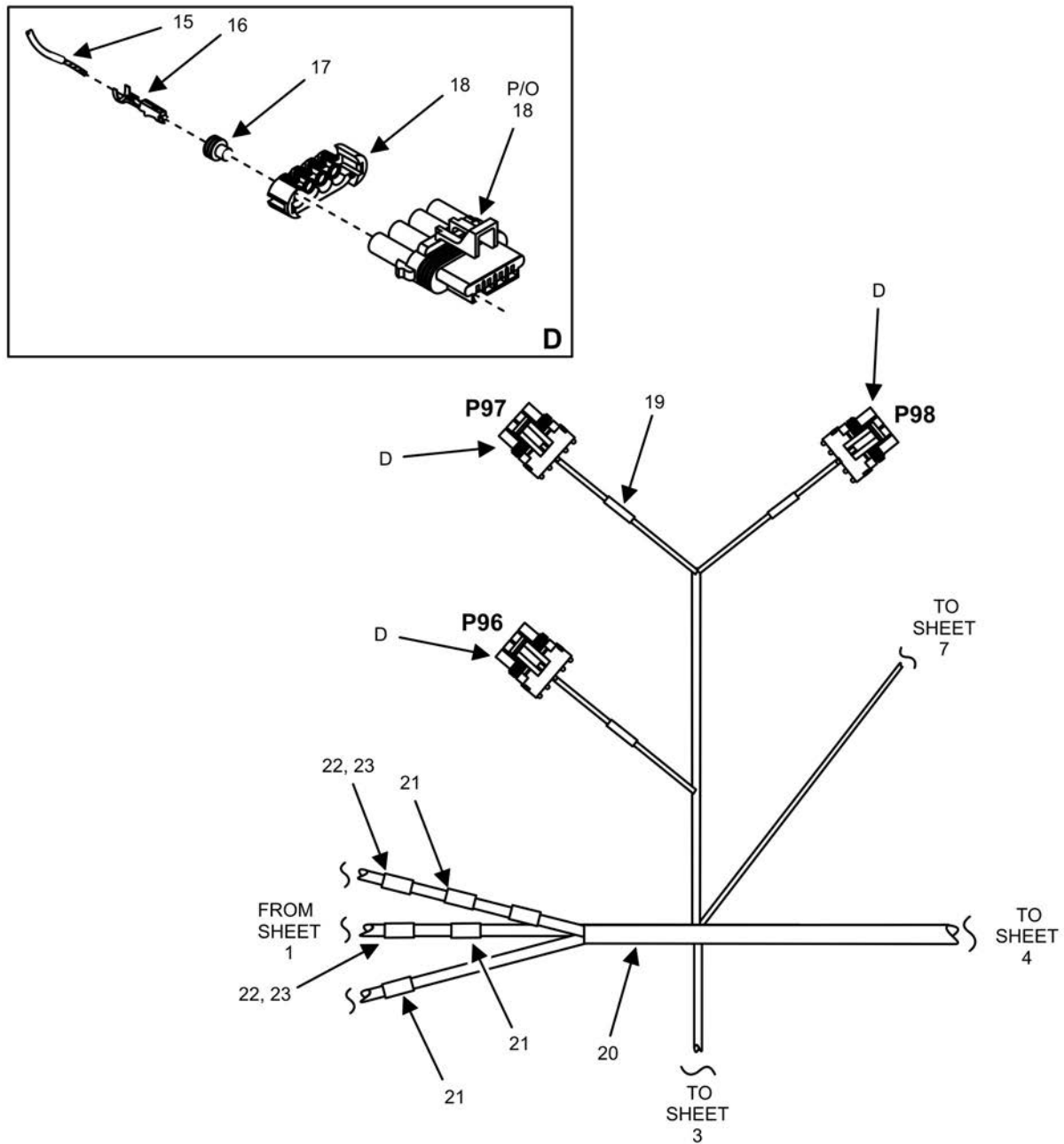


Figure 65. Engine Wiring Harness (Sheet 2 of 19).

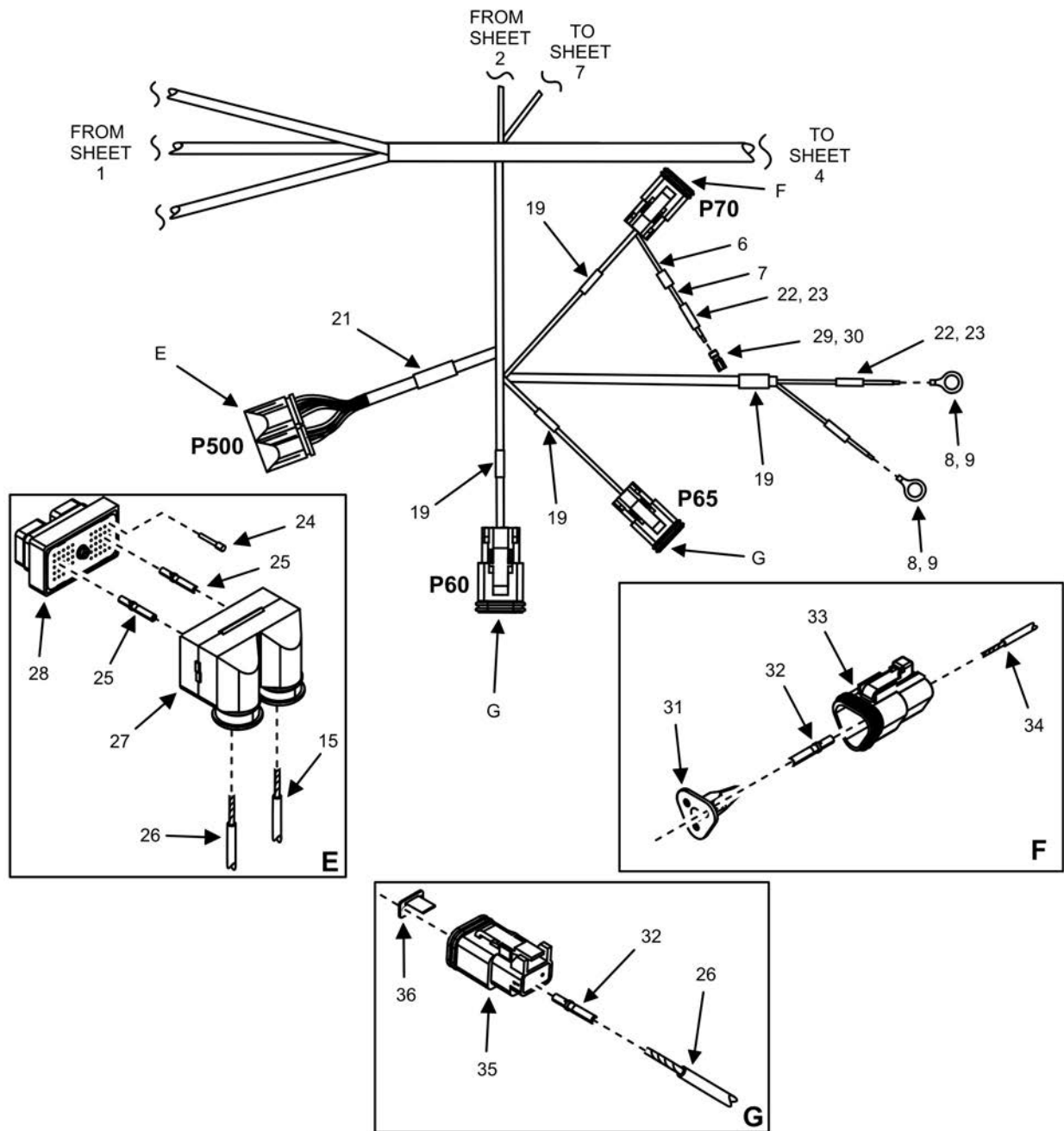
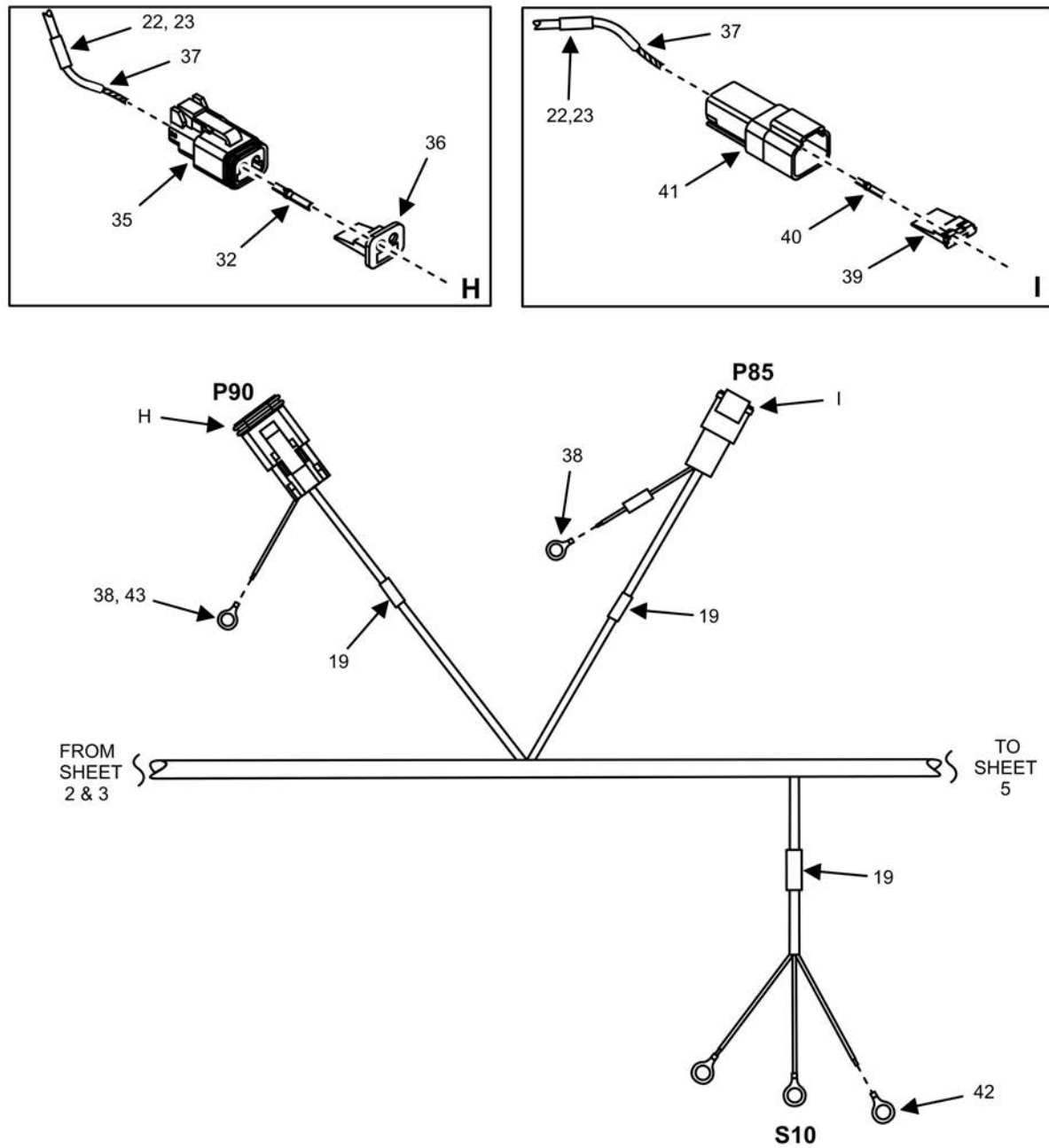


Figure 65. Engine Wiring Harness (Sheet 3 of 19).



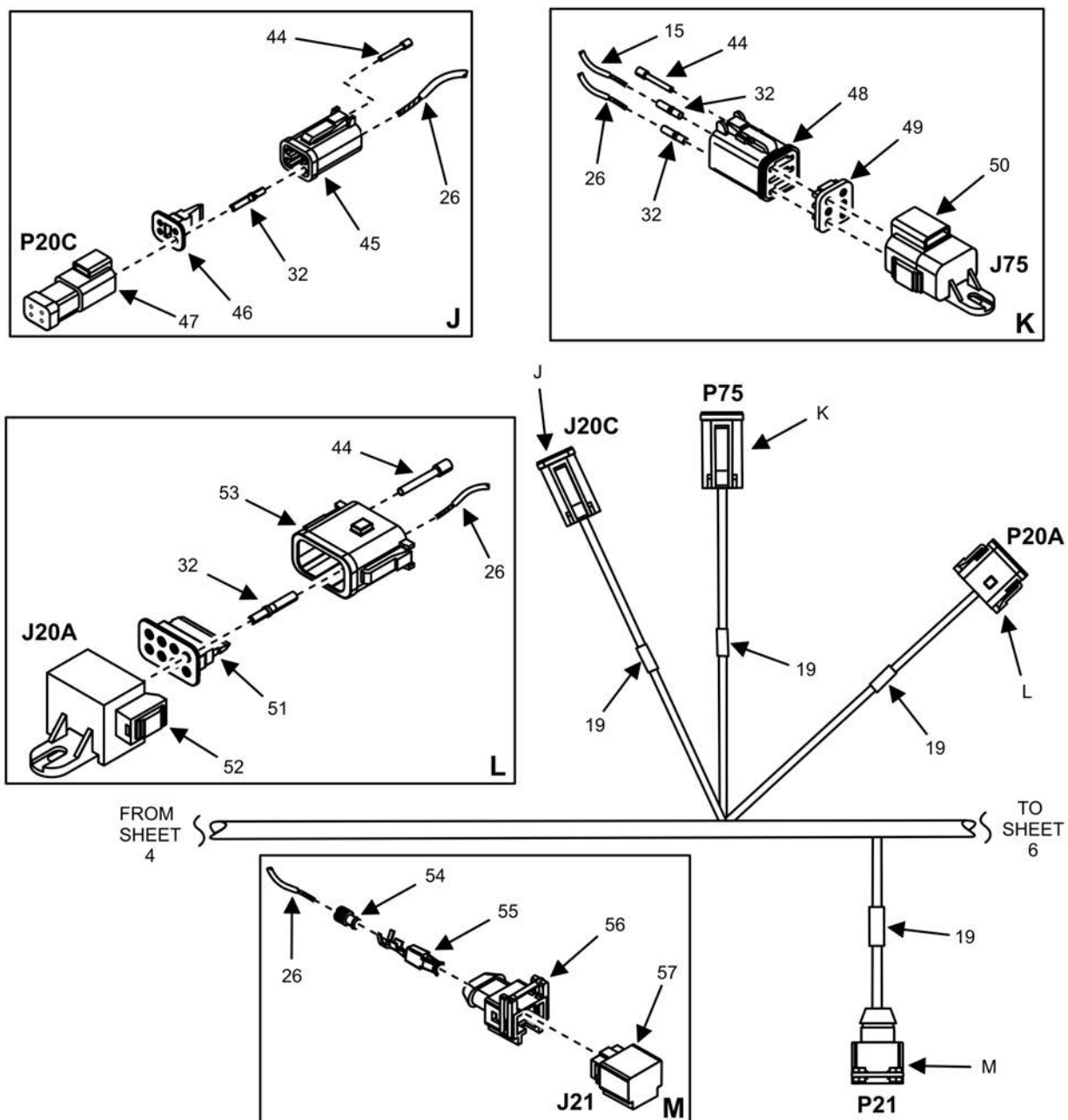


Figure 65. Engine Wiring Harness (Sheet 5 of 19).

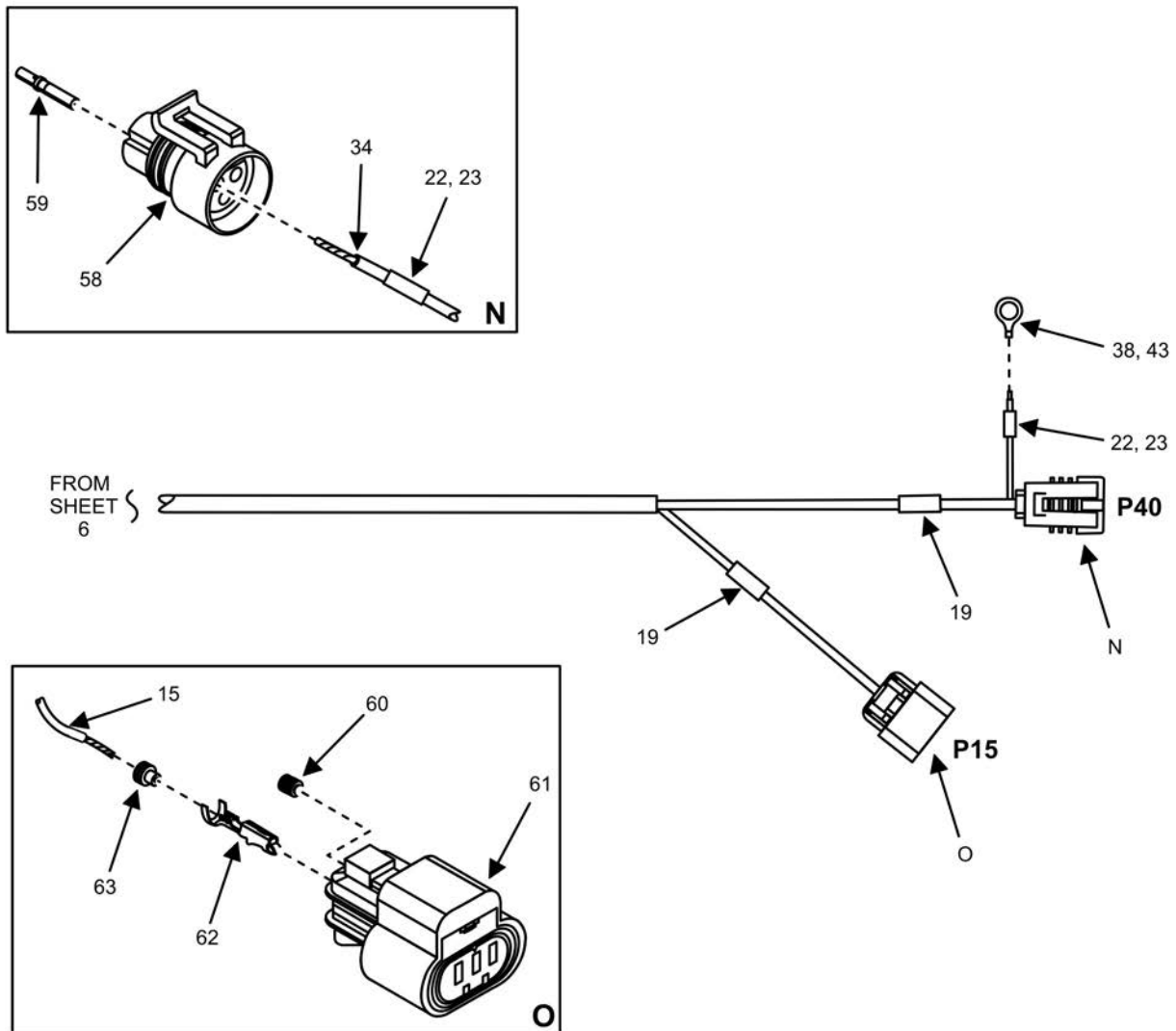


Figure 65. Engine Wiring Harness (Sheet 6 of 19).

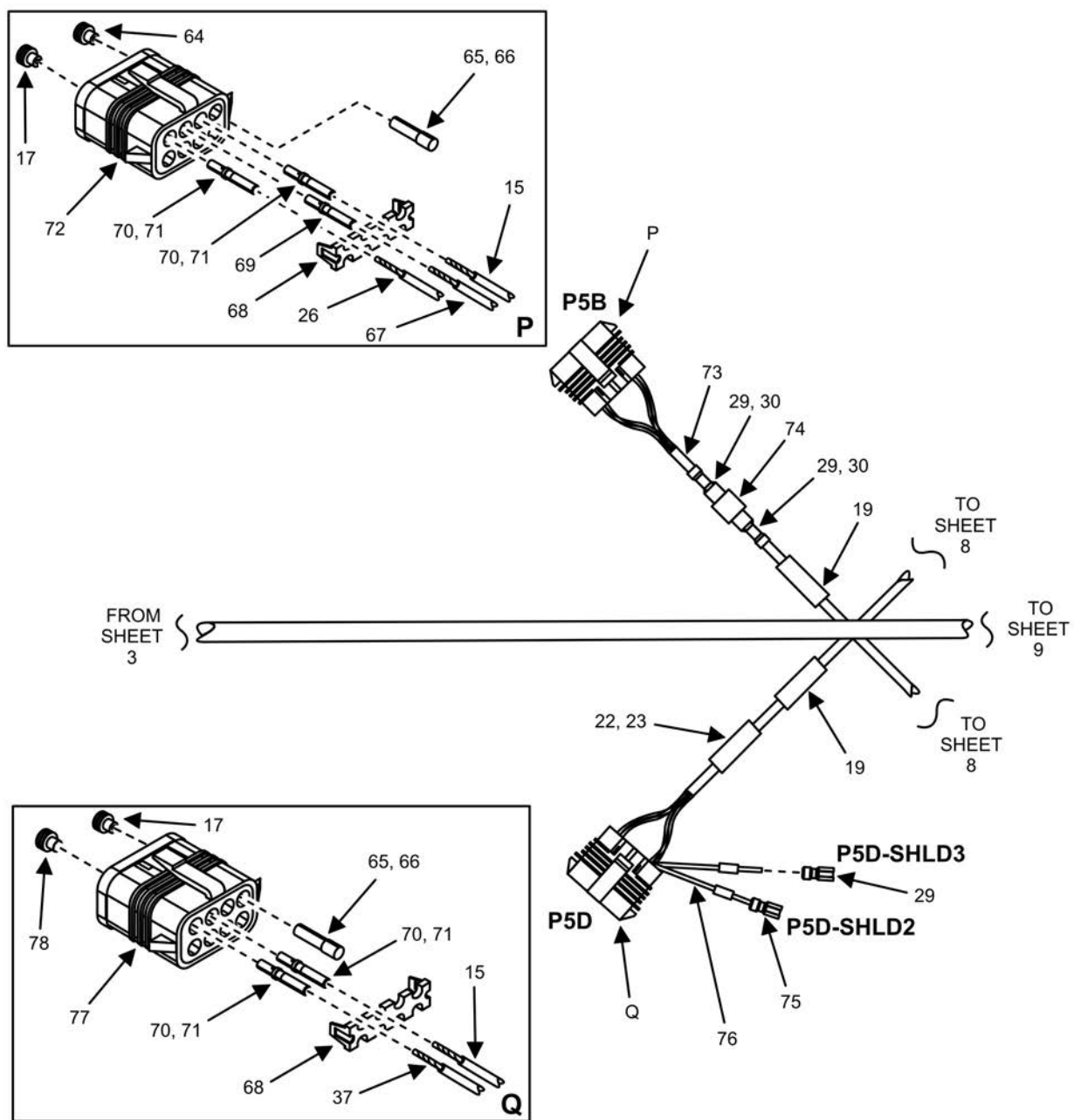


Figure 65. Engine Wiring Harness (Sheet 7 of 19).

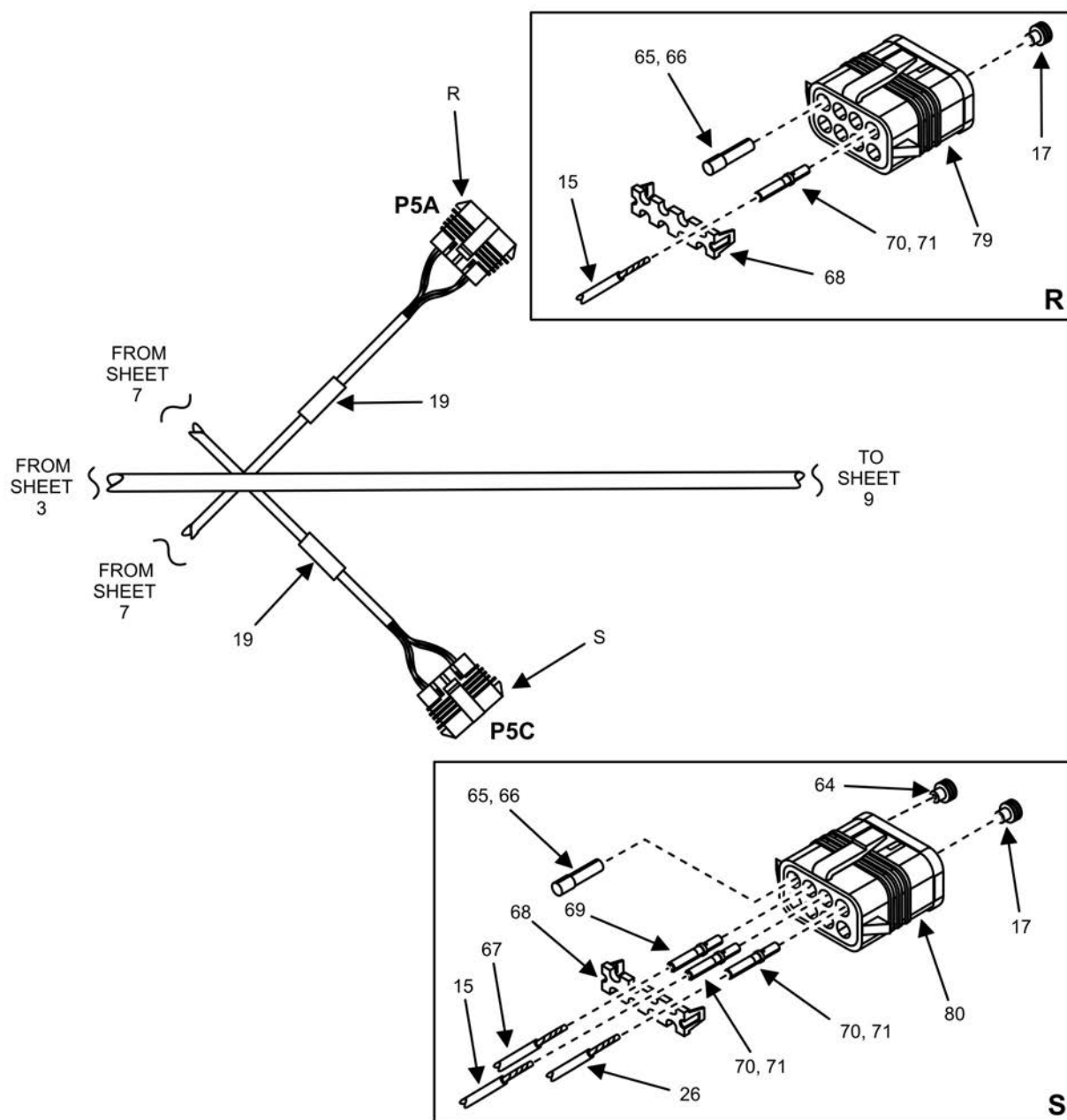


Figure 65. Engine Wiring Harness (Sheet 8 of 19).



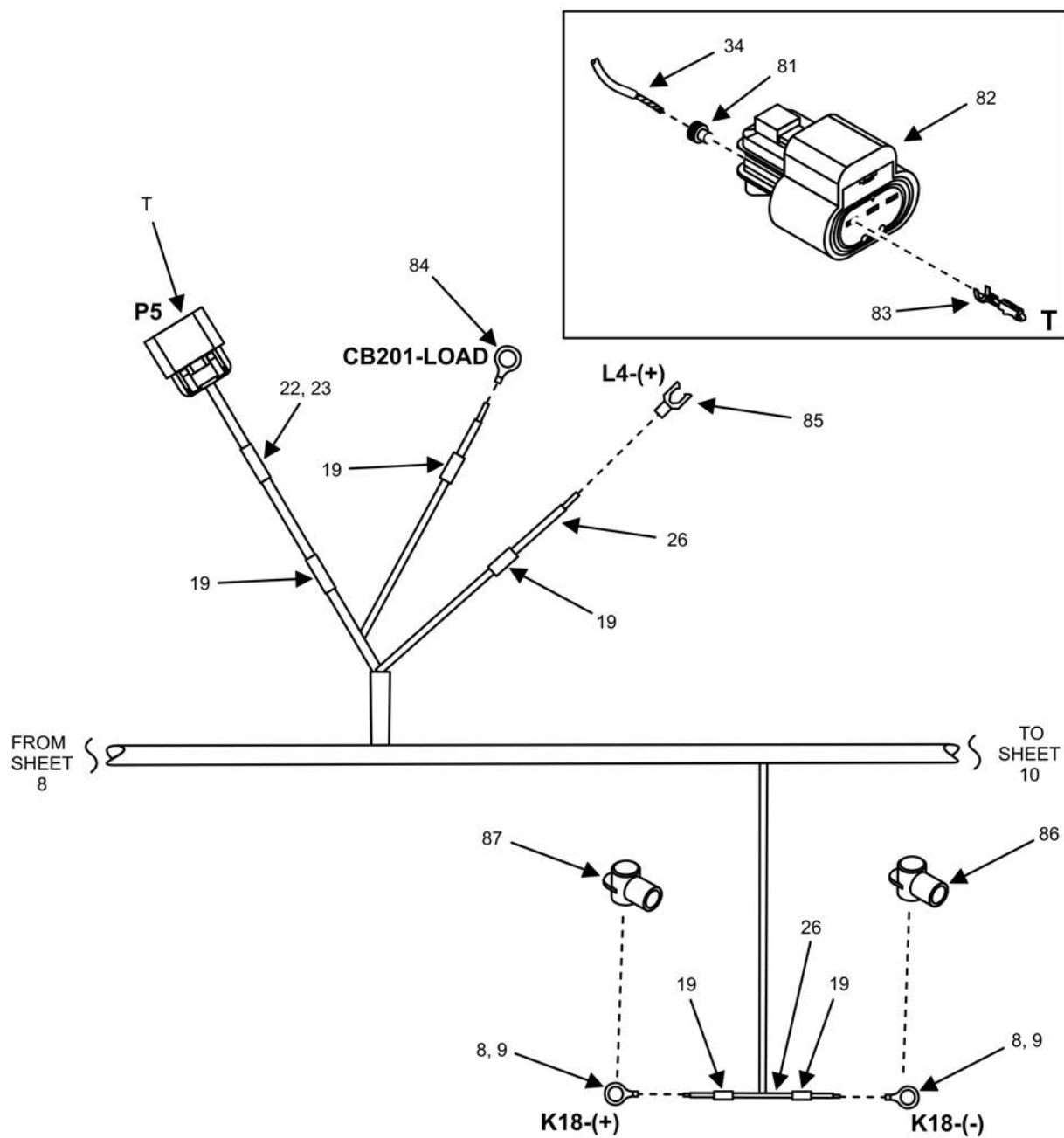


Figure 65. Engine Wiring Harness (Sheet 9 of 19).

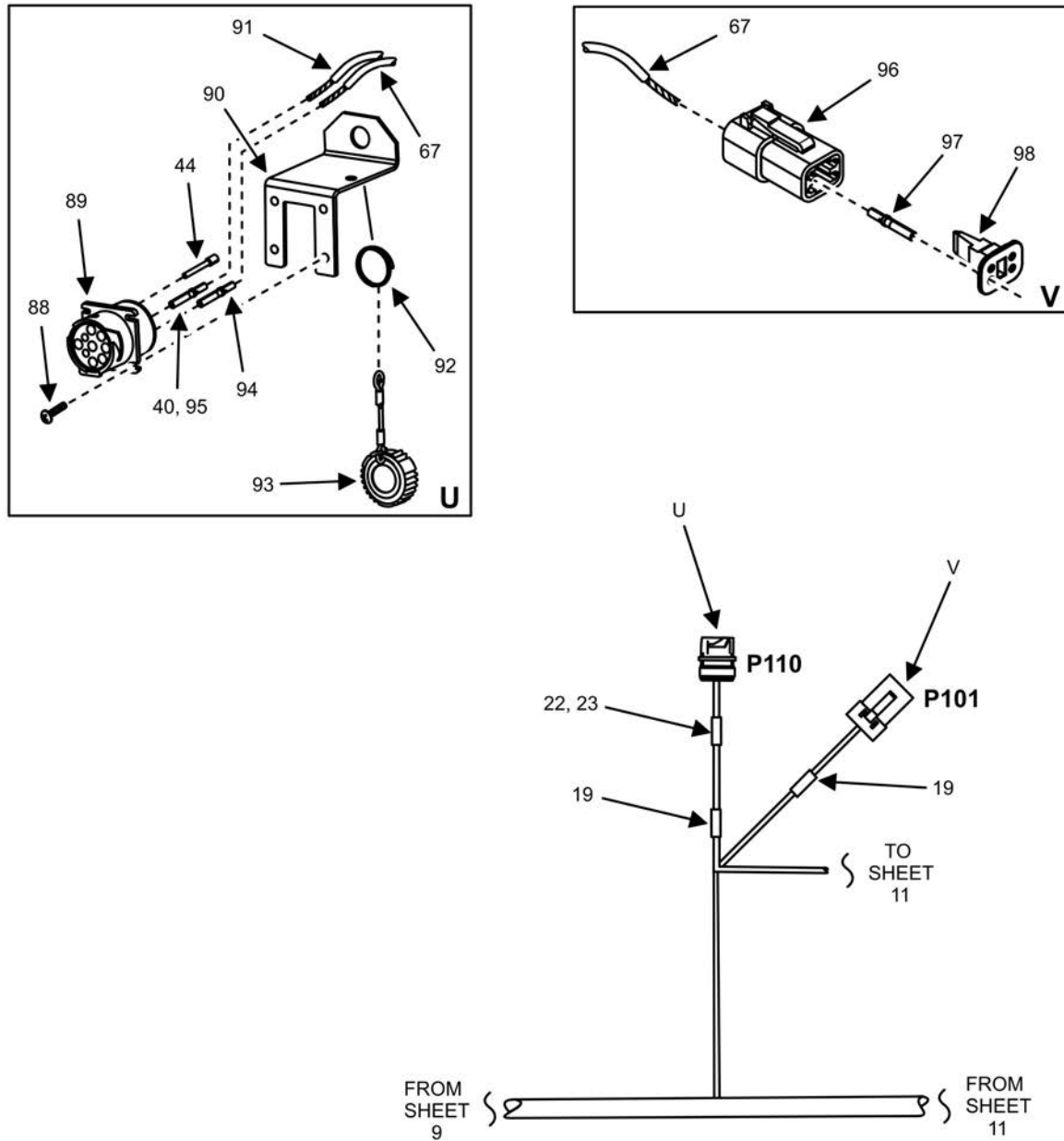


Figure 65. Engine Wiring Harness (Sheet 10 of 19).

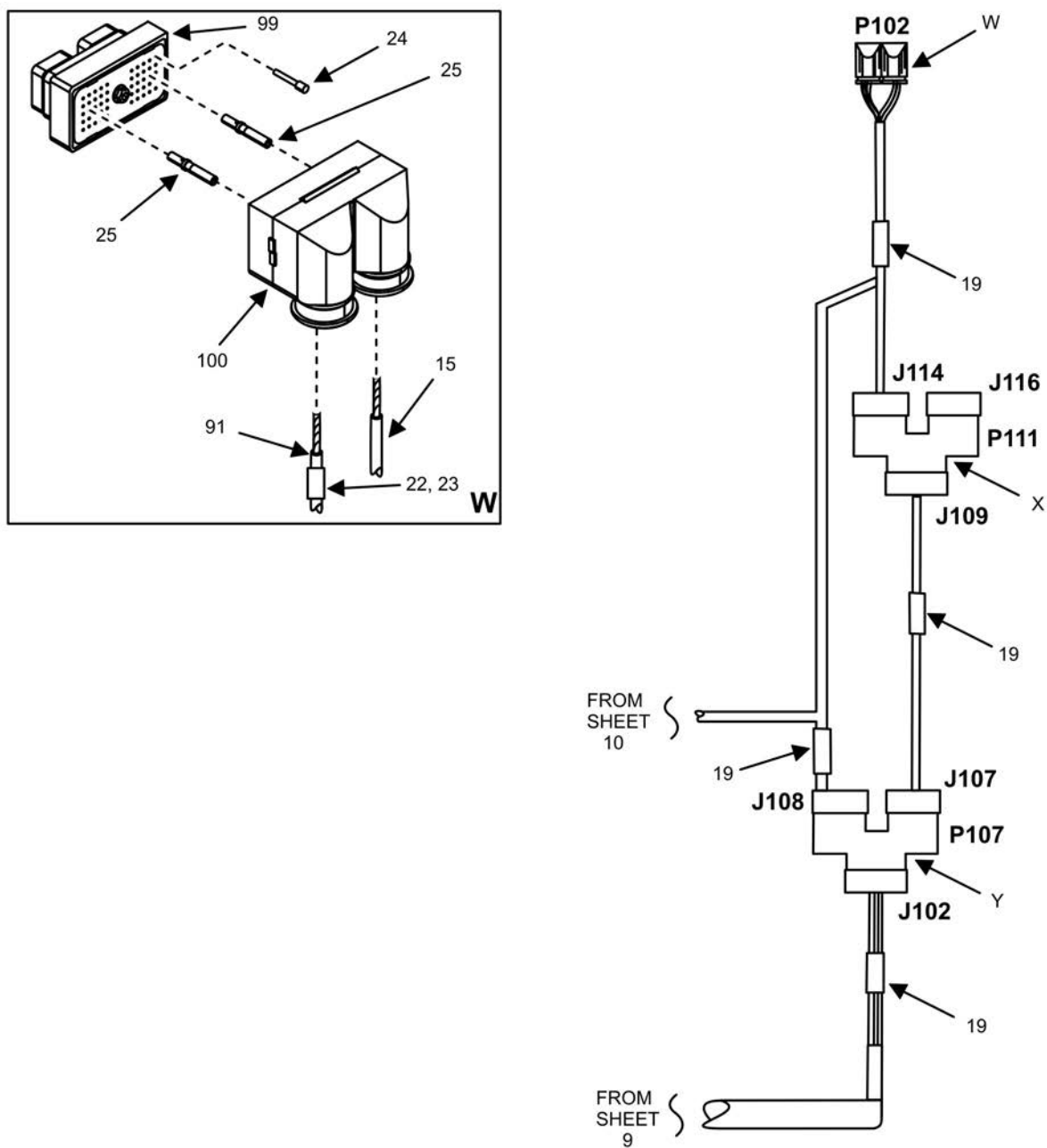


Figure 65. Engine Wiring Harness (Sheet 11 of 19).

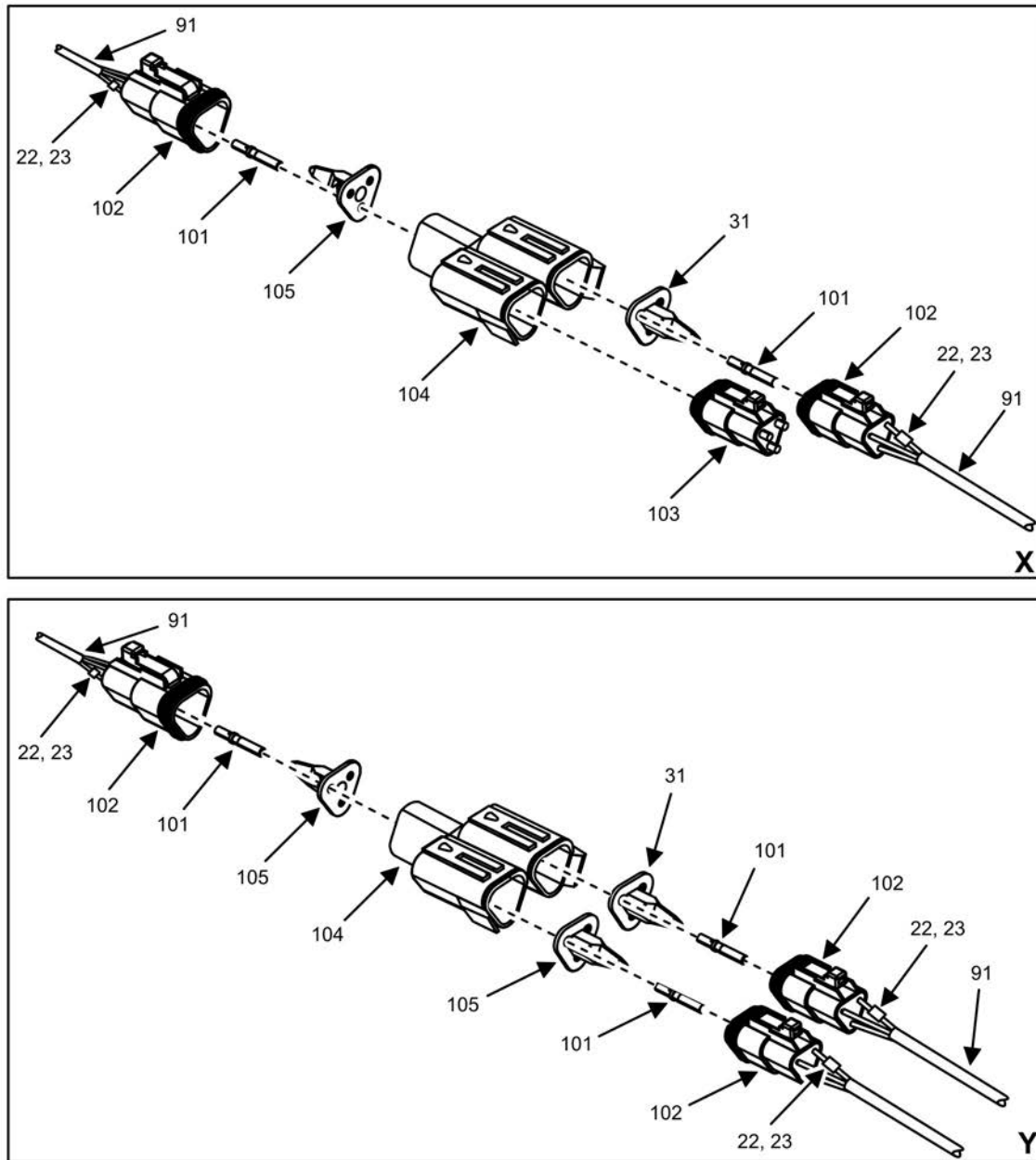


Figure 65. Engine Wiring Harness (Sheet 12 of 19).

UOC	WIRE LABEL	FROM	TO
ALL	P1-A/P500-25	P1-A	P500-25
ALL	P1-C/P500-5	P1-C	P500-5
ALL	P1-D/P500-43	P1-D	P500-43
ALL	P1-E/P500-3	P1-E	P500-3
ALL	P1-G/P500-41	P1-G	P500-41
ALL	P1-J/P90-1	P1-J	P90-1
ALL	P1-K/P90-2	P1-K	P90-2
98L	P1-L/P5D-A	P1-L	P5D-A
98M	P1-L/CB502-LOAD1	P1-L	CB502-LOAD1
98L	P5D-B/P85-1	P5D-B	P85-1
98L	P5D-G/P85-2	P5D-G	P85-2
98L	P1-M/P5D-H	P1-M	P5D-H
98M	P1-M/CB502-LOAD2	P1-M	CB502-LOAD2
ALL	P1-R/P500-21	P1-R	P500-21
ALL	P1-S/P500-23	P1-S	P500-23
ALL	P1-T/P500-1	P1-T	P500-1
ALL	P2-A/P5D-D	P2-A	P5D-D
ALL	P2-B/P5D-C	P2-B	P5D-C
ALL	P2-C/P5D-F	P2-C	P5D-F
ALL	CB201-LOAD/P20A-1	CB201-LOAD	P20A-1
ALL	P2-E/K18-(+)	P2-E	K18-(+)
ALL	P2-F/P500-36	P2-F	P500-36
ALL	P2-G/P75-1	P2-G	P75-1
ALL	P2-H/P60-2	P2-H	P60-2
ALL	P2-K/P500-6	P2-K	P500-6
ALL	P2-L/P5B-G	P2-L	P5B-G
ALL	P2-N/P65-2	P2-N	P65-2
ALL	P2-R/P20A-7	P2-R	P20A-7
ALL	P2-S/P500-30	P2-S	P500-30
ALL	P2-T/P500-37	P2-T	P500-37
ALL	P2-U/J20C-1	P2-U	J20C-1
ALL	P2-V/P65-1	P2-V	P65-1
ALL	P2-W/P500-18	P2-W	P500-18
ALL	P2-Y/P75-2	P2-Y	P75-2
ALL	P2-Z/P60-1	P2-Z	P60-1

Figure 65. Engine Wiring Harness (Sheet 13 of 19).

UOC	WIRE LABEL	FROM	TO
ALL	P2-a/P500-46	P2-a	P500-46
ALL	P2-b/K18-(-)	P2-b	K18-(-)
ALL	P2-d/P5B-H	P2-d	P5B-H
ALL	P2-e/P5B-A	P2-e	P5B-A
ALL	P2-f/P5B-B	P2-f	P5B-B
ALL	P20A-4/P21-1	P20A-4	P21-1
ALL	J20C-2/P21-2	J20C-2	P21-2
ALL	J20C-4/P20A-2	J20C-4	P20A-2
ALL	P3-A/P500-10	P3-A	P500-10
ALL	P3-B/P500-8	P3-B	P500-8
ALL	P3-C/P500-45	P3-C	P500-45
ALL	P3-D/P500-47	P3-D	P500-47
ALL	P3-E/P5-A	P3-E	P5-A
ALL	P3-F/P70-A	P3-F	P70-A
ALL	P3-G/P70-B	P3-G	P70-B
ALL	P3-H/P500-19	P3-H	P500-19
ALL	P3-J/P5-C	P3-J	P5-C
ALL	P3-K/J102-A	P3-K	J102-A
ALL	P3-L/J102-B	P3-L	J102-B
98L	P3-SHLD7/J102-C	P3	J102-C
98M	P3-SHLD6/J102-C	P3	J102-C
ALL	P3-M/P500-16	P3-M	P500-16
ALL	P3-T/P5A-G	P3-T	P5A-G
ALL	P3-U/P5A-D	P3-U	P5A-D
ALL	P3-V/P5A-E	P3-V	P5A-E
ALL	P3-W/P5B-D	P3-W	P5B-D
ALL	P3-Y/P5C-B	P3-Y	P5C-B
ALL	P3-Z/P102-45	P3-Z	P102-45
ALL	P3-b/P500-9	P3-b	P500-9
ALL	P3-c/P500-17	P3-c	P500-17
ALL	P3-d/P500-29	P3-d	P500-29
ALL	P3-e/P500-48	P3-e	P500-48
ALL	P3-f/P40-B	P3-f	P40-B
ALL	P3-g/P40-C	P3-g	P40-C
ALL	P3-j/P70-C	P3-j	P70-C

Figure 65. Engine Wiring Harness (Sheet 14 of 19).

UOC	WIRE LABEL	FROM	TO
ALL	P3-m/p500-50	P3-m	P500-50
ALL	P3-n/P500-20	P3-n	P500-20
ALL	P3-p/P75-4	P3-p	P75-4
ALL	P3-r/P5-B	P3-r	P5-B
ALL	P3-s/P500-40	P3-s	P500-40
ALL	P3-u/P75-3	P3-u	P75-3
ALL	P3-v/P96-C	P3-v	P96-C
ALL	P3-w/P98-C	P3-w	P98-C
ALL	P3-x/P96-B	P3-x	P96-B
ALL	P3-y/P98-B	P3-y	P98-B
ALL	P3-AA/P500-26	P3-AA	P500-26
ALL	P3-BB/P500-7	P3-BB	P500-7
ALL	P3-CC/P500-49	P3-CC	P500-49
ALL	P3-DD/P500-34	P3-DD	P500-34
ALL	P3-GG/P500-39	P3-GG	P500-39
ALL	P3-HH/P97-C	P3-HH	P97-C
ALL	P3-KK/P97-B	P3-KK	P97-B
ALL	P3-LL/P500-38	P3-LL	P500-38
ALL	P3-MM/P500-28	P3-MM	P500-28
ALL	P5A-F/P96-A	P5A-F	P96-A
ALL	P5C-G/P96-D	P5C-G	P96-D
ALL	P5A-C/P97-A	P5A-C	P97-A
ALL	P5C-F/P97-D	P5C-F	P97-D
ALL	P5A-H/P98-A	P5A-H	P98-A
ALL	P5C-E/P98-D	P5C-E	P98-D
ALL	P2-P/P15-2	P2-P	P15-2
ALL	S10-1/P5C-C	S10-1	P5C-C
ALL	S10-2/L4-(+)	S10-2	L4-(+)
ALL	S10-3/P5C-A	S10-3	P5C-A
ALL	P5B-C/P101-3	P5B-C	P101-3
ALL	P5C-H/P101-1	P5C-H	P101-1
ALL	P101-4/P110-B	P101-4	P110-B
ALL	P101-2/P110-A	P101-2	P110-A
ALL	J108-A/P110-C	J108-A	P110-C
ALL	J108-B/P110-D	J108-B	P110-D

Figure 65. Engine Wiring Harness (Sheet 15 of 19).

UOC	WIRE LABEL	FROM	TO
ALL	J108-C/P110-E	J108-C	P110-E
ALL	J107-A/J109-A	J107-A	J109-A
ALL	J107-B/J109-B	J107-B	J109-B
ALL	J107-C/J109-C	J107-C	J109-C
ALL	J114-A/P102-1	J114-A	P102-1
ALL	J114-B/P102-21	J114-B	P102-21
ALL	J114-C/P102-22	J114-C	P102-22
98L	P1-SHLD3/P5D-SHLD3	P1	P5D
98M	P1-SHLD2/NONE	P1	CB502
ALL	P1-SHLD1/P90-SHLD1	P1	P90
ALL	NONE	P3	P5
98L	P5D-SHLD2/P85-SHLD2	P5D	P85
ALL	P3-k/P40-A	P3-k	P40-A
ALL	NONE/P40-SHLD4	P3	P40
98M	NONE/P40-SHLD3	P3	P40
ALL	NONE/P70-SHLD6	P3	P70
98M	NONE/P70-SHLD5	P3	P70

Figure 65. Engine Wiring Harness (Sheet 16 of 19).



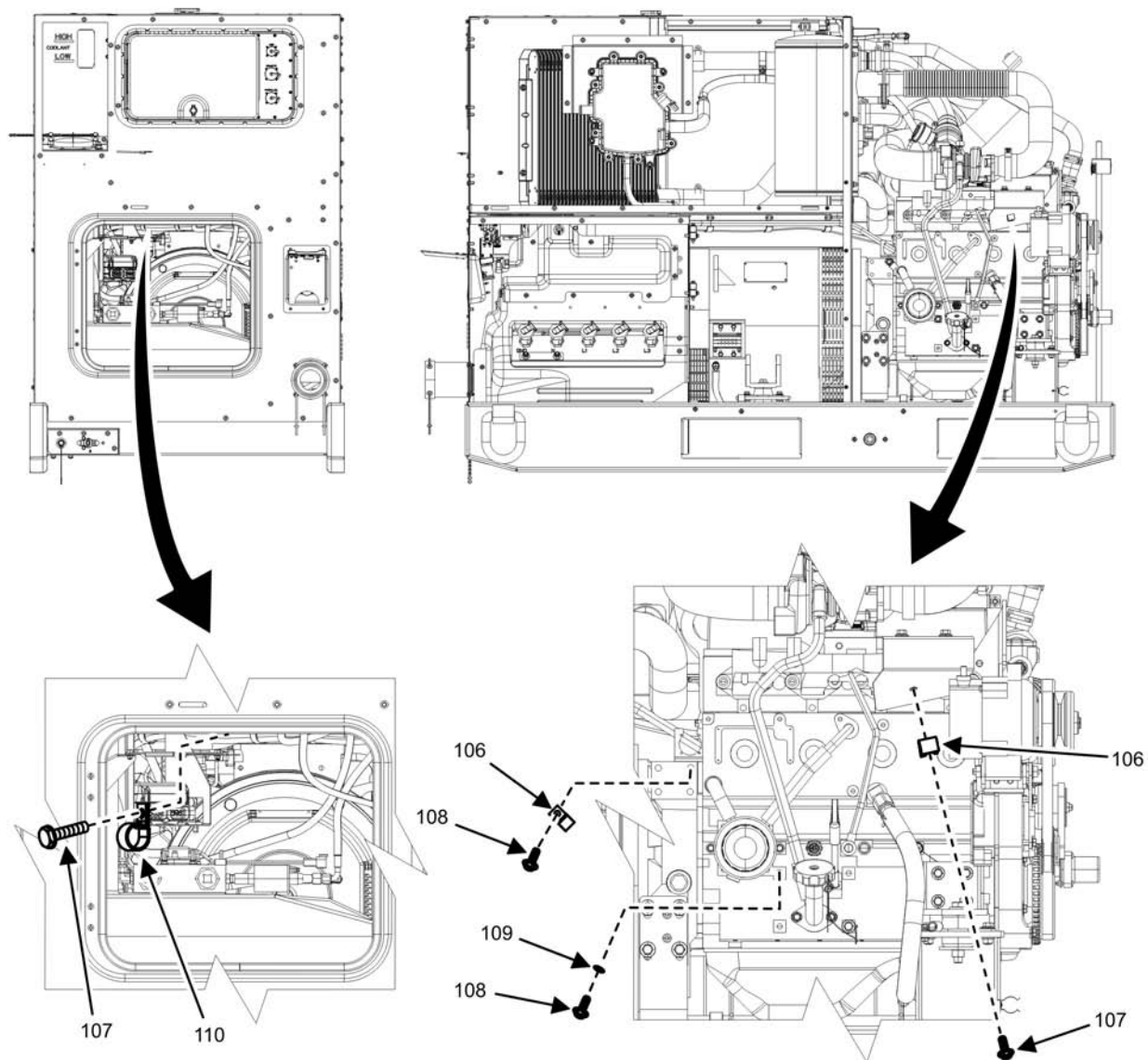


Figure 65. Engine Wiring Harness (Sheet 17 of 19).

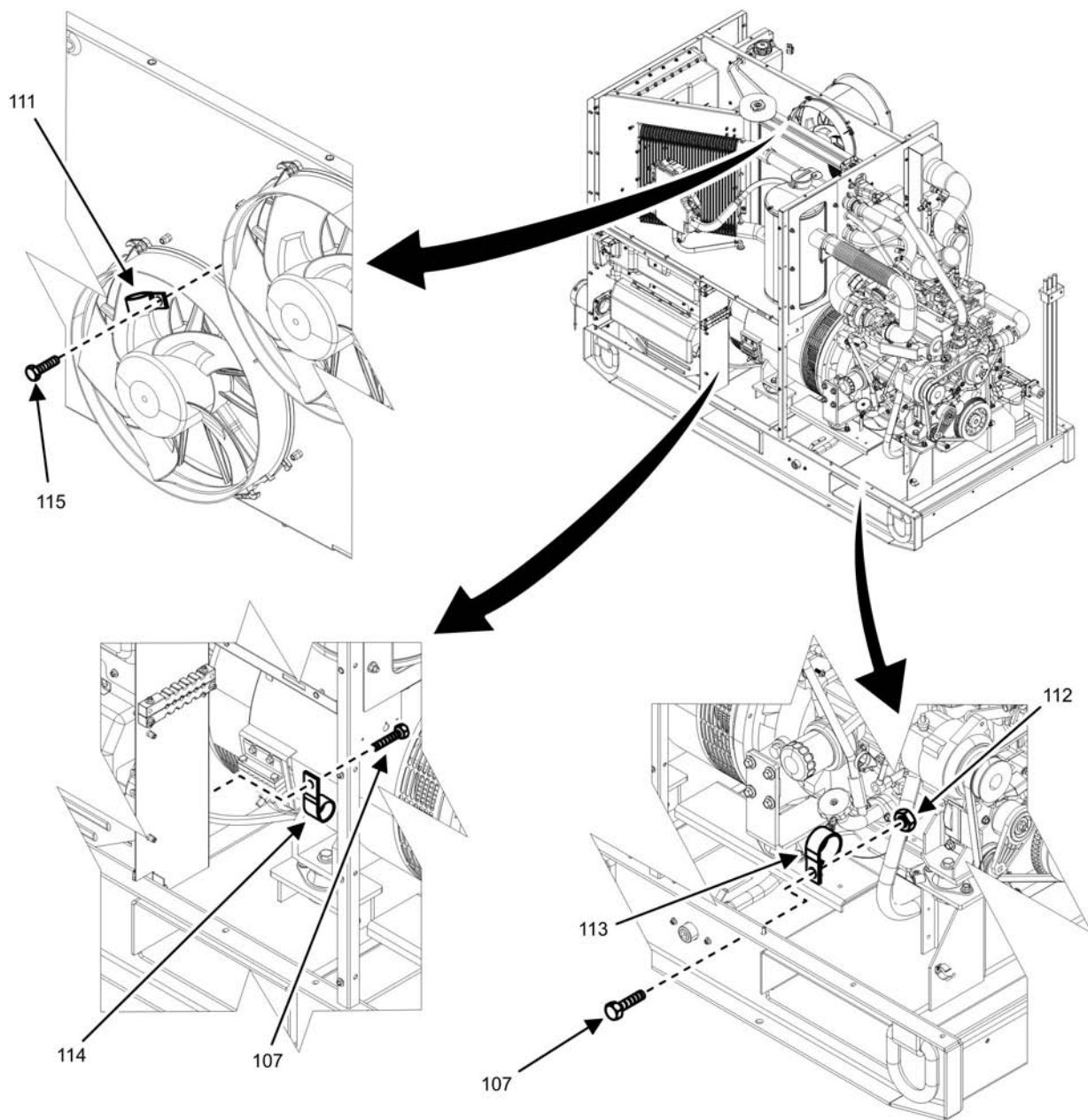


Figure 65. Engine Wiring Harness (Sheet 18 of 19).

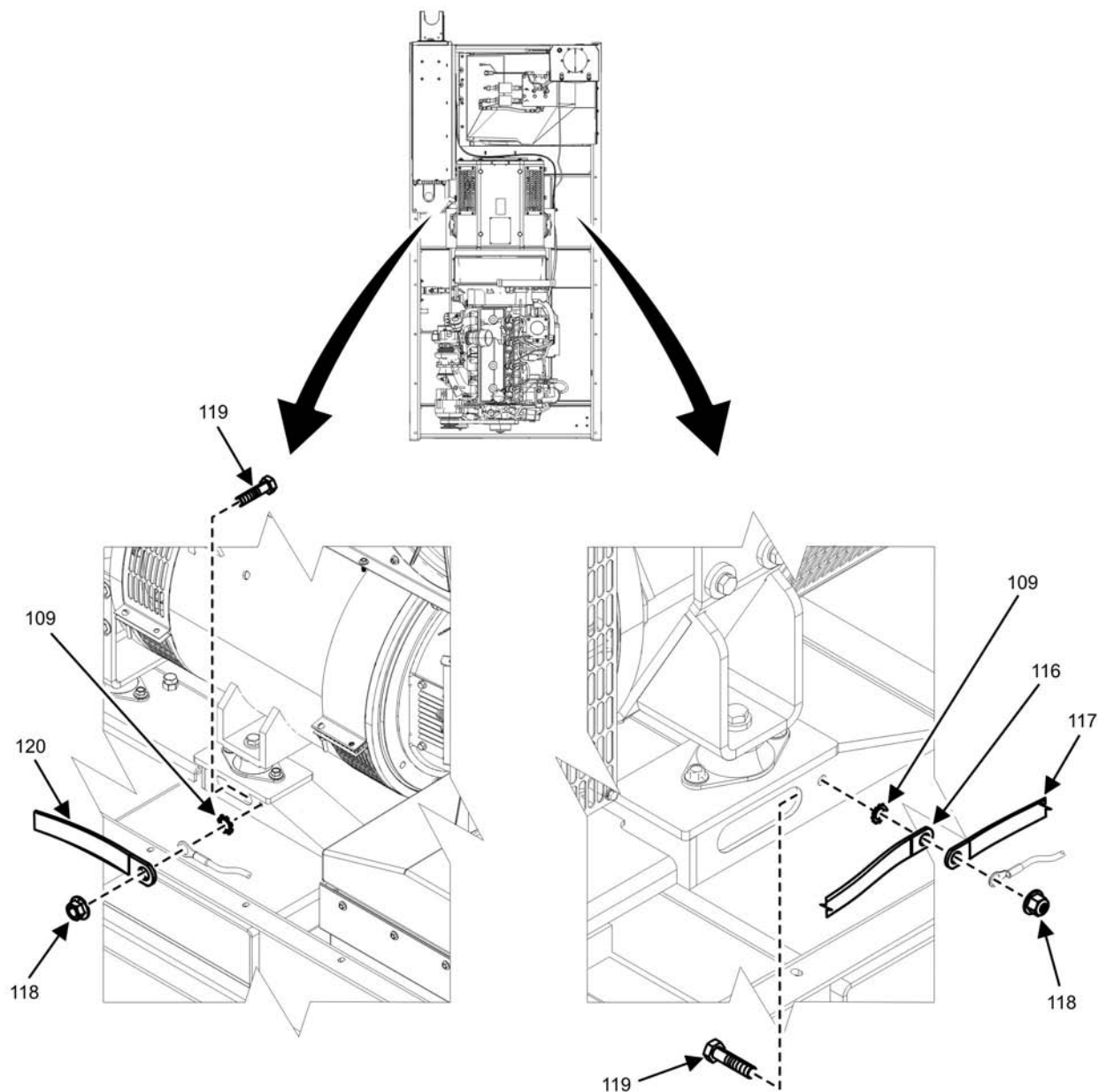


Figure 65. Engine Wiring Harness (Sheet 19 of 19).

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
								GROUP 10	
								FIG. 65 ENGINE WIRING HARNESS	

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
1	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-20013	..WIRING HARNESS, ENGINE UOC: 98L	1
2	PAFFF	PAFFF	PAFFF	PAFFF	6150015967691	44940	04-20765	..WIRING HARNESS, ENGINE UOC: 98M	1
3	XCFFF	XCFFF	XCFFF	XCFFF		OPCR1	CD389/26WJ29SN-BS25	..CONNECTOR, 29 PIN	1
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935012502524	81349	D38999/26WJ29SN	...CONNECTOR, PLUG, ELECTRICAL	1
5	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935013897312	81349	M85049/39-25W	...CLAMP, CABLE, ELECTRICAL	2
6	MFFZZ	MFFZZ	MFFZZ	MFFZZ	5970013261733	92194	TFT-250-16	..INSULATION SLEEVING, ELECTRICAL (MAKE FROM TFT-250-16 ON BULK ITEMS LIST CUT TO LENGTH AS REQUIRED)	1
7	MFFZZ	MFFZZ	MFFZZ	MFFZZ	5970014701630	28105	ST-301-3/16BLAC	..INSULATION SLEEVING (MAKE FROM ST-301-3/16BLAC ON BULK ITEMS LIST CUT TO LENGTH AS REQUIRED)	1
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001434771	81343	MS25036-103	..TERMINAL, LUG UOC: 98L	5
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001434771	81343	MS25036-103	..TERMINAL, LUG UOC: 98M	7
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935011862240	81349	D38999/26WJ61SN	..CONNECTOR, PLUG, ELECTRICAL	1
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ		06324	360HA001NF2520A	..BACKSHELL, STRAIN RELIEF	1
12	XCFFF	XCFFF	XCFFF	XCFFF		OPCR1	CD389/26WH21SN-BS23	..CONNECTOR, 21 PIN	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935013250384	81349	D38999/26WH21SN	...CONNECTOR, PLUG, ELECTRICAL	1
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014142582	81349	M85049/39-23W	...BACKSHELL, ELECTRICAL	1
15	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-20-10	..STRAND, WIRE, 20 AWG (MAKE FROM 3271-20-10 ON BULK ITEMS LIST CUT TO LENGTH AS REQUIRED)	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999013234929	77060	12089188	..CONTACT, ELECTRICAL, 20-18 AWG	12
17	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5340015868449	77060	15324982	..BOOT, DUST AND MOISTURE	32
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935013088599	45152	1788880	..CONNECTOR, BODY, PLUG, 4 PIN	3
19	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG9T3-100B	..LAMINATE, LABEL, COVER	31
20	MFFZZ	MFFZZ	MFFZZ	MFFZZ		3SXL3	55PP02872757640064	..INSULATION SLEEVING (MAKE FROM 55PP02872757640064 ON BULK ITEMS LIST CUT TO LENGTH AS REQUIRED)	1
21	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG3T3-100B	..LAMINATE, LABEL, COVER	5

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
22	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG2T5-100B	..LAMINATE, LABEL, COVER UOC: 98L	62
23	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG2T5-100B	..LAMINATE, LABEL, COVER UOC: 98M	55
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014791823	45152	6HB683	..PLUG, END SEAL, ELECTRICAL CONNECTOR	72
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999015722092	11139	1062-20-0122	..CONTACT, ELECTRICAL, 22-16 AWG	34
26	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-16-26	..STRAND, WIRE, 16 AWG (MAKE FROM 3271-16-26 ON BULK ITEMS LIST CUT TO LENGTH AS REQUIRED)	1
27	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015885256	11139	0528-001-5005	..CONNECTOR, PLUG, HOUSING, 50 PIN	1
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015877612	11139	DRC26-50S04	..CONNECTOR, PLUG, ELECTRICAL, 50 PIN	1
29	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940011129746	30554	88-20275-1	..TERMINAL, DISCONNECT UOC: 98L	4
30	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940011129746	30554	88-20275-1	..TERMINAL, DISCONNECT UOC: 98M	3
31	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014708342	11139	W3S	..POLARIZING KEY, ELECTRICAL, 3 PIN	3
32	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012036687	45152	2ER654	..CONTACT, ELECTRICAL, 22-16 AWG	20
33	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015238855	11139	DT06-3S	..CONNECTOR, PLUG, ELECTRICAL, 3 PIN	1
34	MFFZZ	MFFZZ	MFFZZ	MFFZZ		4AJA4	EF20C0038722	..CABLE, ELECTRICAL, 18 AWG (MAKE FROM EF20C0038722 ON BULK ITEMS LIST CUT TO LENGTH AS REQUIRED)	1
35	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014475814	11139	DT06-2S	..CONNECTOR, BODY, PLUG, 2 PIN	3
36	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014468180	11139	W2S	..CONNECTOR, BODY, PLUG, WEDGE 2 PIN	3
37	MFFZZ	MFFZZ	MFFZZ	MFFZZ	6145012530121	4AJA4	EF20C0028722	..CABLE, SPECIAL PURPOSE, 18 AWG (MAKE FROM EF20C0028722 ON BULK ITEMS LIST, CUT TO LENGTH AS REQUIRED)	1
38	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001434773	81343	MS25036-105	..TERMINAL, LUG UOC: 98L	3
39	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015191808	11139	W2P	..RETAINER, ELECTRICAL UOC: 98L	1
40	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999015905769	11139	1060-16-0622	..CONTACT, PIN UOC: 98L	5

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
41	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015065555	0FW39	12422624	..CONNECTOR, PLUG, ELECTRICAL UOC: 98L	1
42	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940004640117	00779	36152	..TERMINAL, LUG	3
43	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001434773	81343	MS25036-105	..TERMINAL, LUG UOC: 98M	2
44	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935011741235	11139	114017	..PLUG, END SEAL, ELECTRICAL	11
45	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014846537	11139	DT06-4S	..CONNECTOR, PLUG, ELECTRICAL	1
46	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014830852	11139	W4S	..CONNECTOR, RECEPTACLE, WEDGE	1
47	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015235410	11139	DT04-4P-EP13	..CONNECTOR, RECEPTACLE, ELECTRICAL	1
48	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014791567	45152	2HB188	..CONNECTOR, PLUG, ELECTRICAL	1
49	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310015152283	19207	12485651-125	..SECONDARY LOCKNUT	1
50	PAFZZ	PAFZZ	PAFZZ	PAFZZ		11139	1011-347-0605	..CAP, 6 PIN	1
51	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015231411	11139	W8S	.. CONNECTOR, PLUG, ELECTRICAL	1
52	PAFZZ	PAFZZ	PAFZZ	PAFZZ		11139	1011-348-0805	..CONNECTOR, RECEPTACLE, 8 PIN	1
53	PAFZZ	PAFZZ	PAFZZ	PAFZZ	59350158777601	11139	DT06-08SA	..CONNECTOR, PLUG, ELECTRICAL	1
54	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5340015408655	45152	2KP504	..PLUG, PROTECTIVE, DUST AND MOISTURE SEAL	2
55	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015600703	00779	929939-1	..TERMINAL, LUG, 16-20 AWG	2
56	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015716514	00779	963040-3	..CONNECTOR BODY, PLUG	1
57	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999015885580	37GZ4	20593C400	..CAP, CONNECTOR	1
58	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015033305	77060	12065287	..CONNECTOR BODY, PLUG	1
59	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999015821957	77060	12089290	..TERMINAL, QUICK DISCONNECT, 18-16 AWG	3
60	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015938640	7S174	7160-9465	..SEAL, WIRE	2
61	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015938658	7S174	6189-0443	..HOUSING, CONNECTOR	1
62	PAFZZ	PAFZZ	PAFZZ	PAFZZ		7S174	8100-0461	..TERMINAL, SOCKET	1
63	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5930015971176	7S174	7165-0395	..SEAL, WIRE	1
64	PCFZZ	PCFZZ	PCFZZ	PCFZZ	9320015801153	77060	15324980	..RUBBER ROUND SECTION	2
65	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935013399574	77060	12010300	..PLUG, END SEAL, ELECTRICAL UOC: 98L	6
66	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935013399574	77060	12010300	..PLUG, END SEAL, ELECTRICAL UOC: 98M	10
67	MFFZZ	MFFZZ	MFFZZ	MFFZZ	4010015942186	0X4C9	3271-14-41	..STRAND, WIRE, 14 AWG (MAKE FROM 3271-14-41 ON BULK ITEMS LIST CUT TO LENGTH AS REQUIRED)	1
68	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015704538	71400	32006-TP2	..CONNECTOR BODY, MODULAR	4
69	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015181334	77060	12077412	..TERMINAL, QUICK DISCONNECT	2

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
70	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015273588	77060	12077411	..TERMINAL, QUICK DISCONNECT, 20-16 AWG	24
71	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940015273588	77060	12077411	UOC: 98L ..TERMINAL, QUICK DISCONNECT, 20-16 AWG	
72	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015885261	1UW16	32006-B22	UOC: 98M ..CONNECTOR, PLUG, GREY ELECTRICAL	20
73	MFFZZ	MFFZZ	MFFZZ	MFFZZ		28105	ST-301-3/4BLAC	..INSULATION SLEEVING (MAKE FROM ST-301-3/4BLAC ON BULK ITEMS LIST CUT TO LENGTH AS REQUIRED)	1
74	PAFZZ	PAFZZ	PAFZZ	PAFZZ		3EUR0	GH60-04G-B-LF	..RECTIFIER, SILICON	1
75	PAFZZ	PAFZZ	PAFZZ	PAFZZ		56501	88-20275-2	..TERMINAL, DISCONNECT UOC: 98L	1
76	MFFZZ	MFFZZ	MFFZZ	MFFZZ		28105	ST-301-1/4BLAC	..INSULATION, SLEEVING (MAKE FROM ST-301-1/4BLAC ON BULK ITEMS LIST CUT TO LENGTH AS REQUIRED)	1
77	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015699542	71400	32006-C22	..CONNECTOR, PLUG, GREEN ELECTRICAL	1
78	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5975013604293	77060	12015899	..BOOT, DUST AND MOISTURE SEAL	4
79	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015699460	71400	32006-A22	..CONNECTOR, PLUG, BLACK ELECTRICAL	1
80	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015699470	71400	32006-D22	..CONNECTOR, PLUG, BLUE ELECTRICAL	1
81	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5340015891081	1V6F3	15366021	..SEAL	3
82	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015859802	1V6F3	15326808	..CONNECTOR, RECEPTACLE	1
83	PAFZZ	PAFZZ	PAFZZ	PAFZZ		1V6F3	12191818	..CONTACT, PIN, 16-18 AWG	3
84	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940002835281	81343	MS25036-109	..TERMINAL, LUG, RING 5/16, 16-14 AWG	1
85	PAFZZ	PAFZZ	PAFZZ	PAFZZ		00779	52937-1	..TERMINAL, SPADE, NO. 10, 16-14 AWG	1
86	PCFZZ	PCFZZ	PCFZZ	PCFZZ		7Z043	218N1T14	..BOOT, DUST AND MOISTURE (BLACK)	1
87	PCFZZ	PCFZZ	PCFZZ	PCFZZ		7Z043	218N1T02	..BOOT, DUST AND MOISTURE (RED)	1
88	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305011937594	80205	MS3212-13L	..SCREW, CAP, SOCKET HEAD	4
89	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014701978	11139	HD10-9-1939P	..ADAPTER, CONNECTOR, 9 PIN	1
90	XBFZZ	XBFZZ	XBFZZ	XBFZZ		30554	04-21463	..BRACKET, DIAGNOSTIC CONNECTOR	1

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
91	MFFZZ	MFFZZ	MFFZZ	MFFZZ		4AJA4	EF20P0011939	..CABLE, ELECTRICAL, 2 CONDUCTOR (MAKE FROM EF20P0011939 ON BULK ITEMS LIST CUT TO LENGTH AS REQUIRED)	1
92	PAFZZ	PAFZZ	PAFZZ	PAFZZ		2V507	14375T9	..RING, RETAINING	1
93	PAFZZ	PAFZZ	PAFZZ	PAFZZ		11139	HDC16-9-L47N	..PLUG, CAP	1
94	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999013734494	11139	0460-215-16141	..CONTACT, ELECTRICAL	2
95	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999015905769	11139	1060-16-0622	..CONTACT, PIN UOC: 98M	3
96	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015224172	11139	DTP06-4S	..CONNECTOR, PLUG, ELECTRICAL, 4 PIN	1
97	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999012801438	12361	7-826-000092	..CONTACT, ELECTRICAL, 18-14 AWG	4
98	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015121010	11139	WP-4S	..RETAINER, ELECTRICAL	1
99	PAFZZ	PAFZZ	PAFZZ	PAFZZ		11139	DRC26-60S06	..CONNECTOR, PLUG, 60 PIN	1
100	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015954970	11139	0528-002-6005	..CONNECTOR, HOUSING, PLUG, 60 PIN	1
101	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999014706330	11139	0462-201-1631	..CONTACT, ELECTRICAL	15
102	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014702406	11139	DT06-3S-E008	..CONNECTOR, PLUG, ELECTRICAL, 3 PIN	5
103	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5985014802392	11139	DT06-35-P006	..RESISTOR, TERMINATING	1
104	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014802382	11139	DT04-3P-P007	..CONNECTOR, INTERFACE, 9 PIN	2
105	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935014708343	19207	12421882	..POLARIZING KEY, ELECTRICAL, 3 PIN	3
106	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015868472	75272	COV-0813	..CLAMP, LOOP	2
107	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015921168	05047	AES10M06A020WB4K42	..SCREW, CAP, HEXAGON HEAD	5
108	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015919022	80204	AES10M10C020WB4K42	..SCREW, CAP, HEXAGON HEAD	2
109	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AEW20M010000DB8A31	..WASHER, LOCK, EXTERNAL TOOTH	4
110	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340004044098	75272	COV-1713	..CLAMP, LOOP	1
111	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340004256432	75272	COV-0613Z1	..CLAMP, LOOP	1
112	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5310332082057	D8286	DIN6923-M6	..NUT, PLAIN, EXTENDED	2
113	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340004044100	75272	COV2113	..CLAMP, LOOP	2
114	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340000538994	80205	MS21333-126	..CLAMP, LOOP	1
115	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A025WB4K42	..SCREW, HEX FLANGE HEAD	1
116	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6145015954654	5T0Q1	EM4M200	..STRAP, GROUNDING	1
117	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5999015886563	5T0Q1	EM4D147	..STRAP, GROUNDING	1
118	PAFZZ	PAFZZ	PAFZZ	PAFZZ		2V507	92461A500	..NUT, HEX FLANGE	2
119	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES07M10C030CG2K41	..BOLT, M10	2
120	PAFZZ	PAFZZ	PAFZZ	PAFZZ	6145015886588	5T0Q1	EM4E393	..STRAP, GROUNDING	1
END OF FIGURE									



**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**POWER WIRING HARNESS REPAIR PARTS LIST**

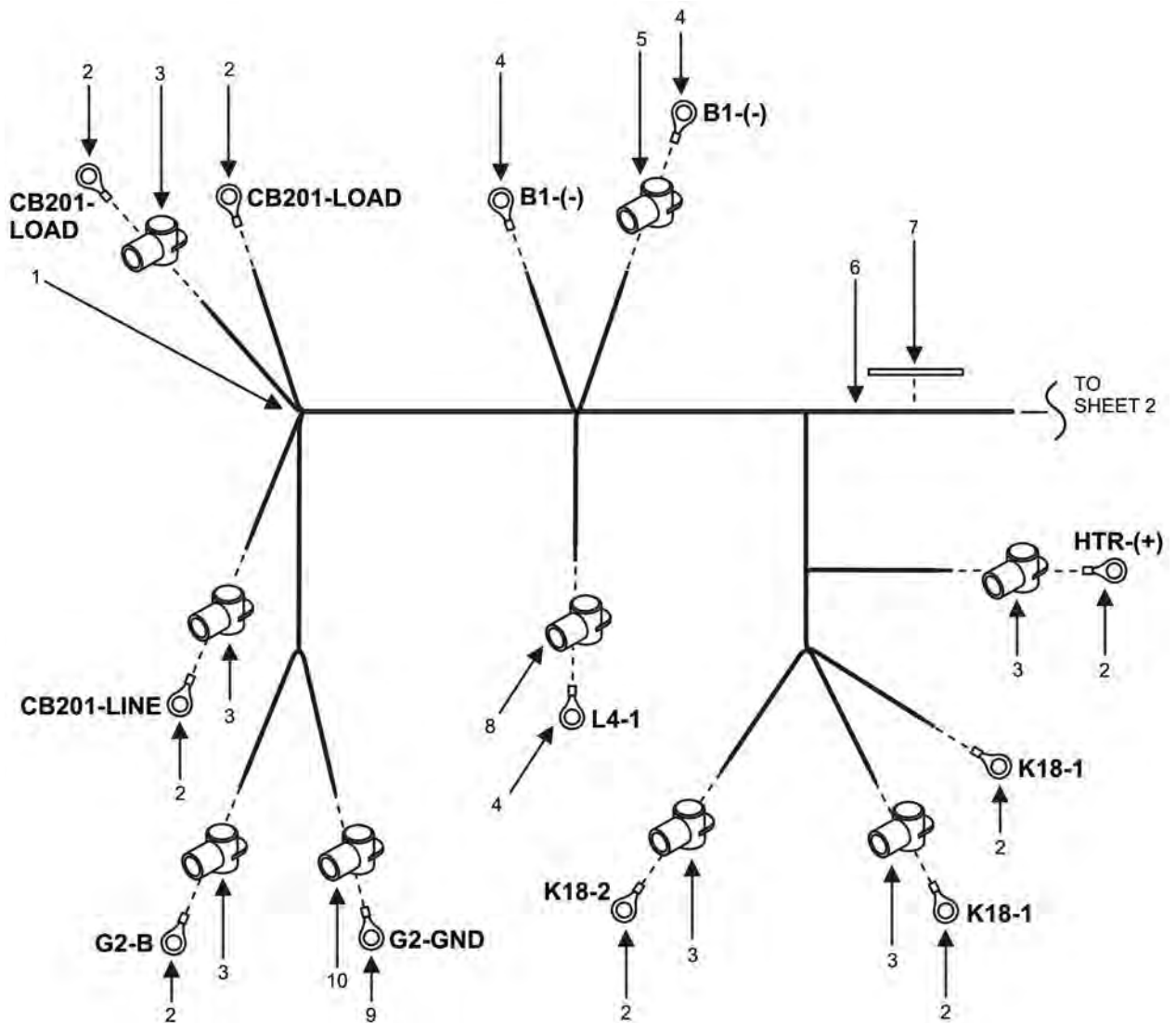
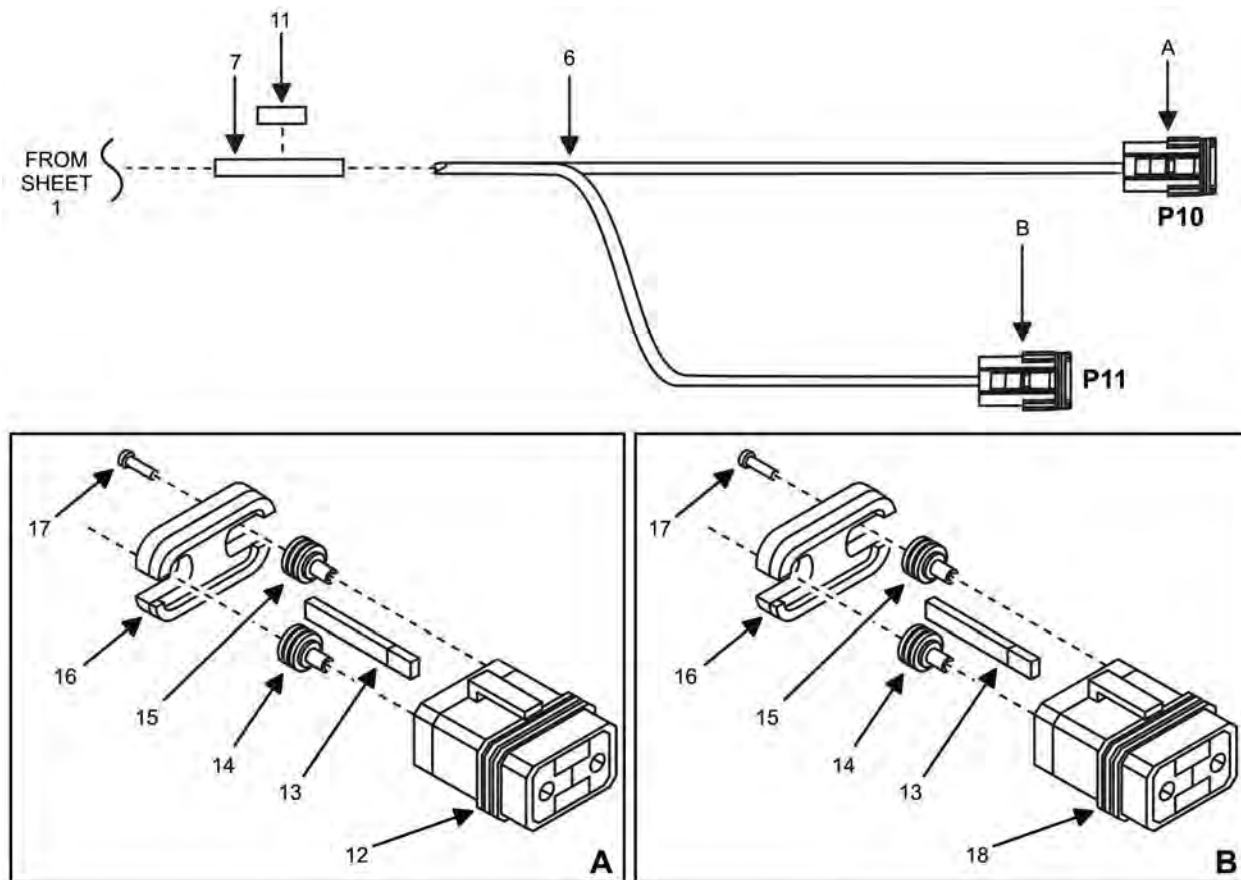


Figure 66. Power Wiring Harness (Sheet 1 of 3).



WIRE LABEL	FROM	TO
P10-1/CB201-LOAD	P10-1	CB201-LOAD
P11-1/B1-(-)	P11-1	B1-(-)
K18-1/CB201-LOAD	K18-1	CB201-LOAD
K18-2/HTR-(+)	K18-2	HTR-(+)
CB201-LINE/L4-1	CB201-LINE	L4-1
G2-B/K18-1	G2-B	K18-1
B1-(-)/G2-GND	B1-(-)	G2-GND

Figure 66. Power Wiring Harness (Sheet 2 of 3).

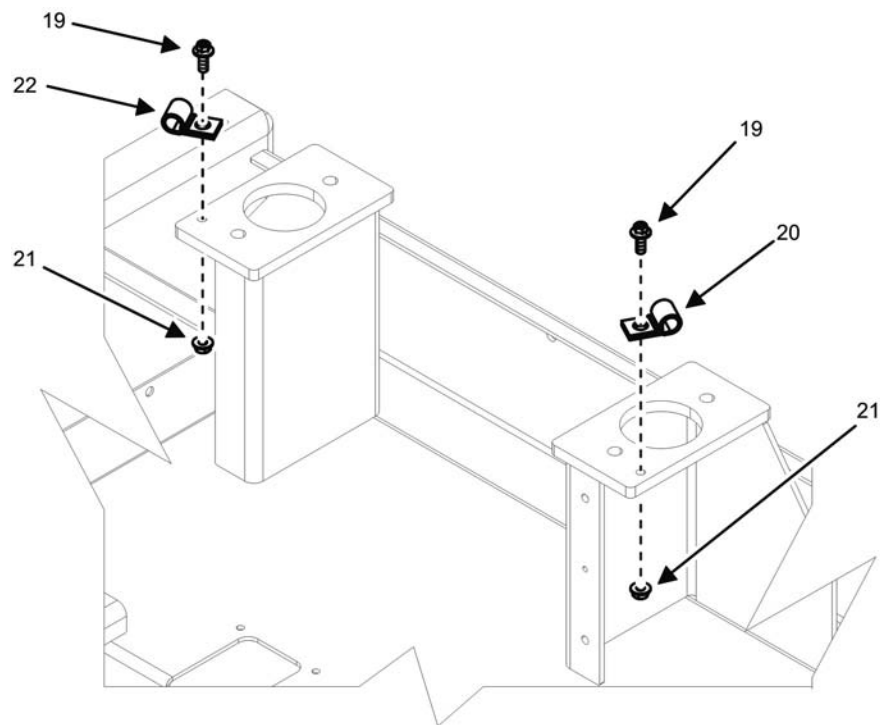


Figure 66. Power Wiring Harness (Sheet 3 of 3).

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
GROUP 11									
FIG. 66 POWER WIRING HARNESS									
1	PAFFF	PAFFF	PAFFF	PAFFF		44940	04-21100	.HARNESS, POWER	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940008799509	00779	33462	..TERMINAL, LUG, RING, M8, 5/16 IN	8
3	PCFZZ	PCFZZ	PCFZZ	PCFZZ		7Z043	222N2T02	..BOOT, DUST AND MOISTURE (RED)	6
4	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940001141315	96906	MS20659-142	..TERMINAL, LUG, RING, M12, 1/2 IN	3
5	PCFZZ	PCFZZ	PCFZZ	PCFZZ		7Z043	234N3T14	..BOOT, DUST AND MOISTURE	1
6	MFFZZ	MFFZZ	MFFZZ	MFFZZ		0X4C9	3271-8-133	..STRAND, WIRE, 8 AWG (MAKE FROM 3271-8-133 ON BULK ITEMS LIST CUT TO LENGTH AS NEEDED)	1
7	MFFZZ	MFFZZ	MFFZZ	MFFZZ		3SXL3	55PP02872757640064	..INSULATION SLEEVE (MAKE FROM 55PP02872757640064 ON BULK ITEMS LIST CUT TO LENGTH AS NEEDED)	1
8	PCFZZ	PCFZZ	PCFZZ	PCFZZ		7Z043	234N3T02	..BOOT, DUST AND MOISTURE (RED)	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5940002376779	96906	MS20659-29	..TERMINAL, LUG, RING, 3/8 IN	1
10	PCFZZ	PCFZZ	PCFZZ	PCFZZ		7Z043	222N2T14	..BOOT, DUST AND MOISTURE (BLACK)	1
11	XBFZZ	XBFZZ	XBFZZ	XBFZZ		53421	TAG9T3-100B	..LAMINATE, LABEL COVER	3
12	PAFZZ	PAFZZ	PAFZZ	PAFZZ		1UW16	32004-B2	..CONNECTOR, PLUG, ELECTRICAL	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ		1V6F3	12129414	..SOCKET, TERMINAL, 8 AWG	2
14	PCFZZ	PCFZZ	PCFZZ	PCFZZ		1V6F3	15355390	..SEAL, 8 AWG WIRE	2
15	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5935015703453	71400	15336703	..SEAL RING, ELECTRICAL PLUG CONNECTOR	2
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015704557	71400	32004-TP2	..CONNECTOR BODY, RECEPTACLE COVER	2
17	PCFZZ	PCFZZ	PCFZZ	PCFZZ	5340011917772	11139	114018	..PLUG, PROTECTIVE, DUST AND MOISTURE SEAL	2
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5935015699506	71400	32004-A2	..CONNECTOR, PLUG, ELECTRICAL	1
19	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015921168	05047	AES10M06A020WB4K42	...SCREW, M6	2
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015868472	75272	COV-0813	...CLAMP, LOOP	1
21	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	...NUT, PLAIN, EXTENDED M6	2
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015894619	75272	COV-2013	...CLAMP, LOOP	1
END OF FIGURE									

FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
WINTERIZATION KIT INSTALLATION REPAIR PARTS LIST

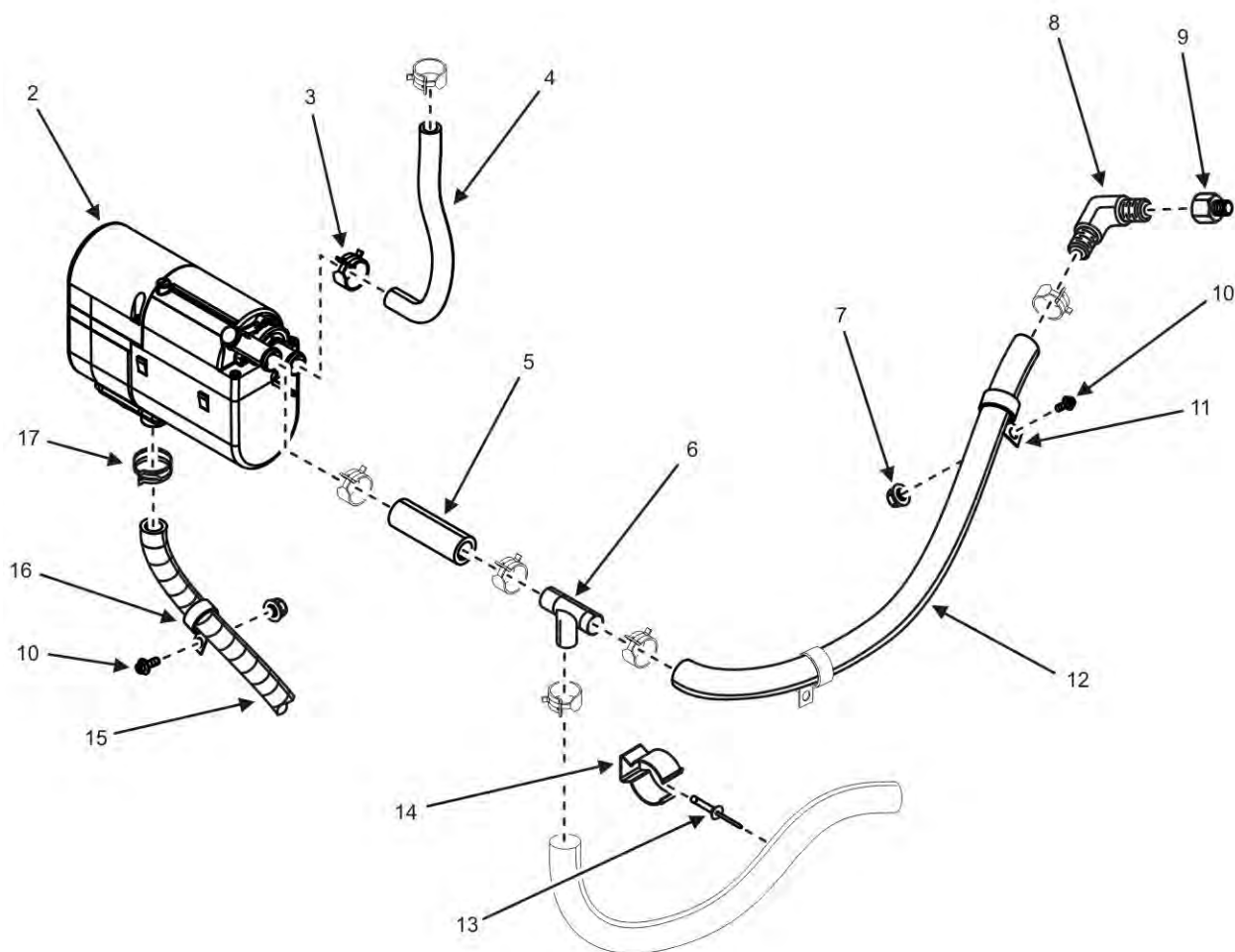
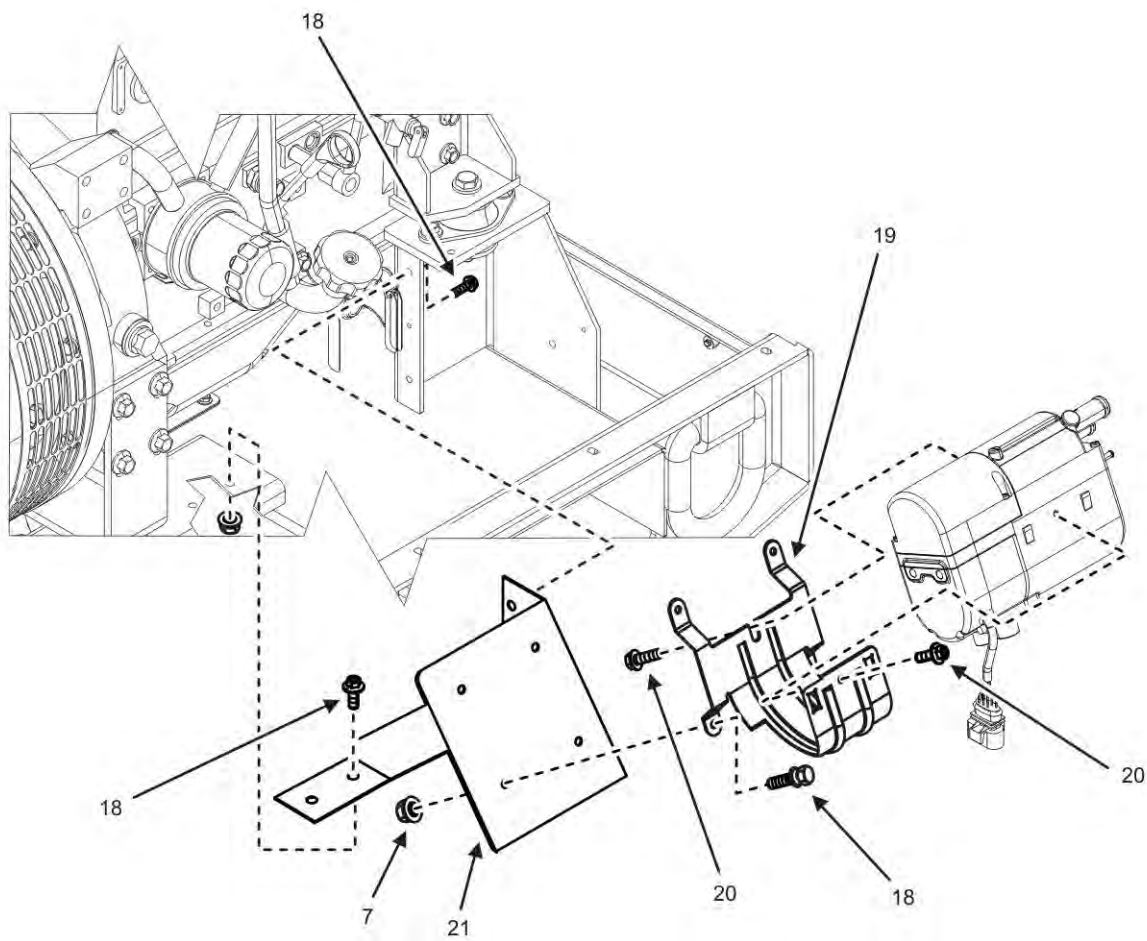


Figure 67. Winterization Kit Installation (Sheet 1 of 4).



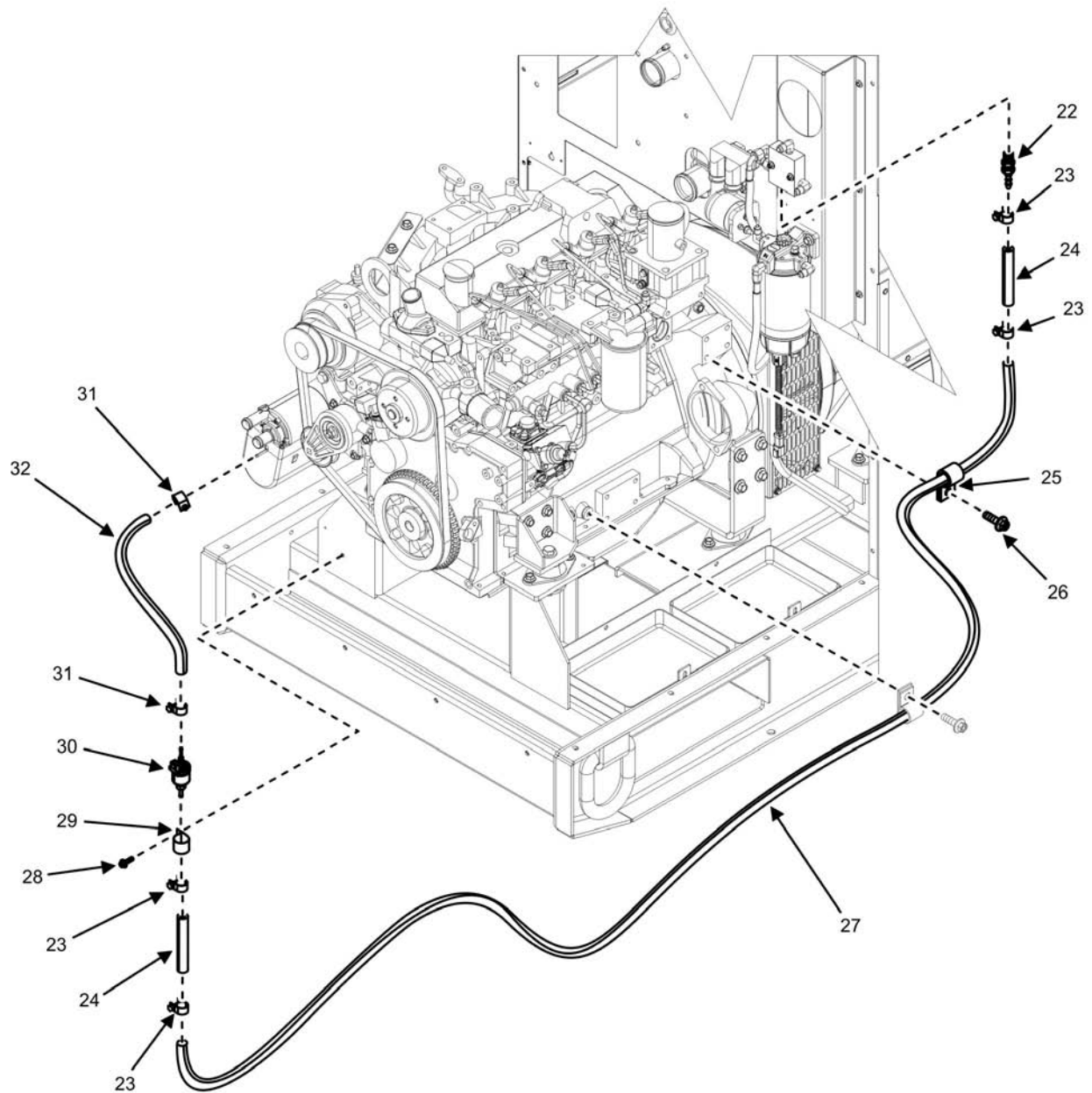


Figure 67. Winterization Kit Installation (Sheet 3 of 4).

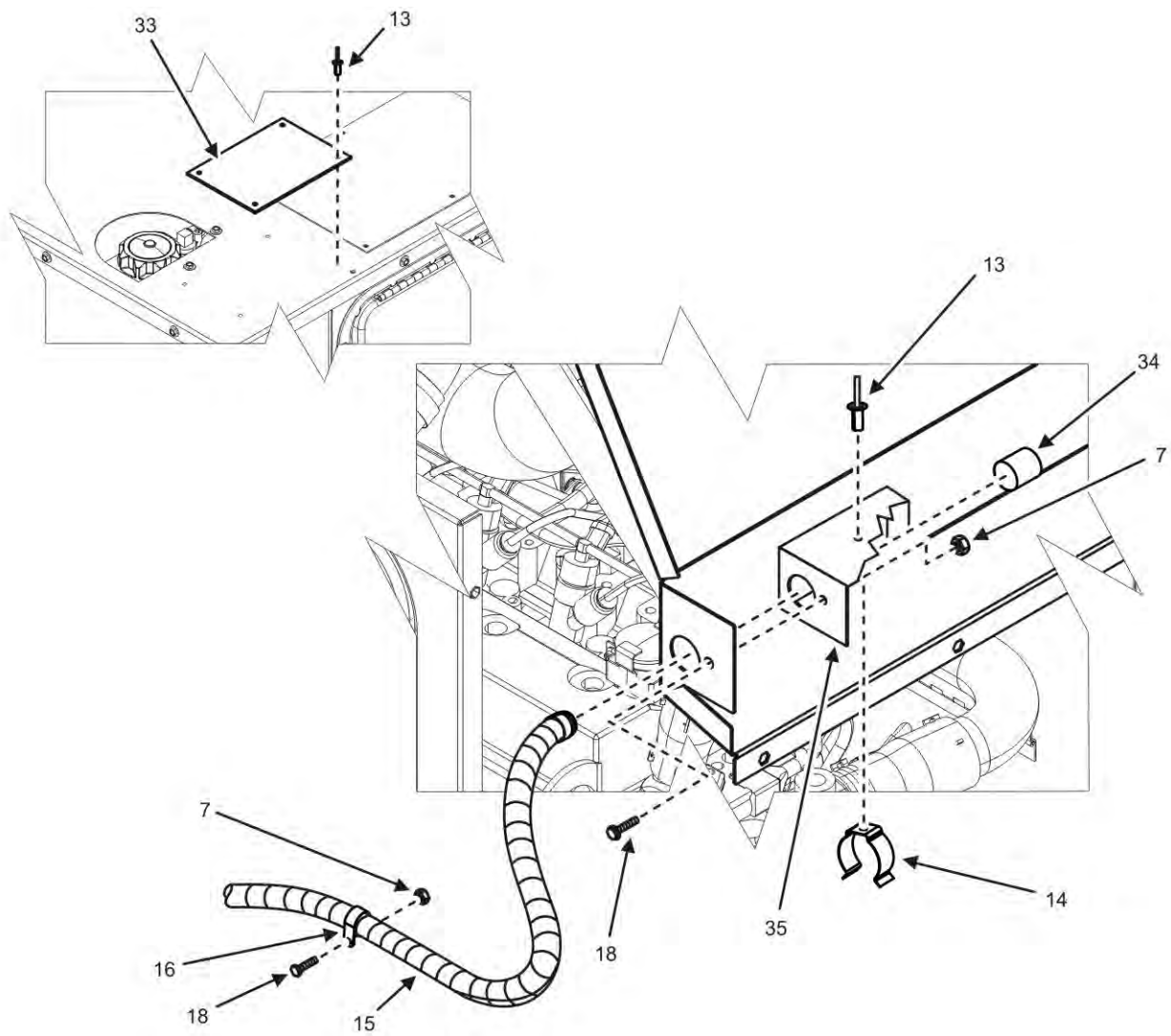


Figure 67. Winterization Kit Installation (Sheet 4 of 4).



(1) ITEM NO.	ARMY	(2) SMR CODE AIR FORCE	USMC	NAVY	(3) NSN	(4) CAGEC	(5) P/N	(6) DESCRIPTION AND UOC	(7) QTY.
								GROUP 12	
								FIG. 67. WINTERIZATION KIT INSTALLATION.	
1	PAFZZ	PAFZZ	PAFZZ	PAFZZ		30554	04-21538	.KIT, WINTERIZATION (NOT SHOWN)	1
2	PAFZZ	PAFZZ	PAFZZ	PAFZZ		38453	99-20-0019	.HEATER	1
3	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015967215	44940	SAEJ1508CTB-27	.CLAMP, TYPE CBT	7
4	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21208-5	.HOSE, NONMETALLIC 3/4 INCH ID (MAKE FROM 30-10-0003 ON BULK ITEMS LIST CUT TO LENGTH 427.6 MM +/- 10)	1
5	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21208-6	.HOSE, NONMETALLIC 3/4 INCH ID (MAKE FROM 30-10-0003 ON BULK ITEMS LIST CUT TO LENGTH AS REQUIRED)	1
6	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730015957417	3A054	91355K54	.ADAPTER, TEE 3/4 INCH OD BARB	1
7	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	DIN6923-M6	.NUT, HEX FLANGE M6X1	10
8	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ123112-8430260B	.ELBOW 90 DEGREE 0.50- INCH NPT X 0.75 OD BARB	1
9	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5975015886200	44940	SAEJ5148-6140139C	.ADAPTER, PIPE 3/8-18 NPFT X 1/2 - 14 NPFT	1
10	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015921168	05047	AES10M06A020WB4K42	.SCREW, HEX FLANGE HEAD (M6 X 1.0 X 20MM)	4
11	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015894619	75272	COV-2013	.CLAMP, HOSE	3
12	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21208-2	.HOSE, NONMETALLIC 3/4 INCH ID (MAKE FROM 30-10-0003 ON BULK ITEMS LIST CUT TO LENGTH 893.50 MM +/- 10)	1
13	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5320009321972	81349	M24243/6-A402H	.RIVET, BLIND HEAD	6
14	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340015883558	78553	C22275-020-4	...CLIP	2
15	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21551-2	.TUBE, FLEXIBLE EXHAUST (MAKE FROM 60-30-0012 ON BULK ITEMS LIST CUT TO LENGTH 1460 MM +/- 10)	1
16	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340005505943	81343	MS122916	.CLAMP, TUBE	2
17	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340200062750	38453	50-40-0018	.CLAMP, TUBE 30MM ID	1

(1)	(2)				(3)	(4)	(5)	(6)	(7)
ITEM NO.	ARMY	SMR CODE AIR FORCE	USMC	NAVY	NSN	CAGEC	P/N	DESCRIPTION AND UOC	QTY.
18	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015963670	05047	AES10M06A016WB4K42	.SCREW, HEX FLANGE HEAD M6X1X16	10
19	XBFZZ	XBFZZ	XBFZZ	XBFZZ		38453	50-60-0045	.BRACKET, HEATER	1
20	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	AES10M06A012WB4K42	.SCREW, HEX FLANGE HEAD M6X1X12	2
21	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21530	.BRACKET, HEATER	1
22	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4730014491233	93061	125HB-3-4	.ADAPTER, HOSE, .25 INCH NPT MALE TO BARB .19	1
23	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAE J1508 D11	.CLAMP, HOSE	4
24	PAFZZ	PAFZZ	PAFZZ	PAFZZ	4720200059979	38453	40-10-0017	.HOSE, FUEL 5MM ID	2
25	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5340014706383	22175	JM86LC6SS6R	.CLAMP, LOOP CUSHIONED	2
26	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015919022	44940	AES10M10C020WB4K42	.SCREW, HEX FLANGE HEAD M10 X 1.5 X 20	2
27	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-21547-2	.TUBE, FLEXIBLE (MAKE FROM 40- 10-0005 ON BULK ITEMS LIST CUT TO LENGTH 1525 MM +/- 10)	1
28	PAFZZ	PAFZZ	PAFZZ	PAFZZ	5305015980197	05047	AES10M06A030WB4K42	.SCREW, HEX FLANGE HEAD M6X1X30	1
29	PAFZZ	PAFZZ	PAFZZ	PAFZZ		38453	50-60-0028	.CLAMP, TUBE	1
30	PAFZZ	PAFZZ	PAFZZ	PAFZZ	2910200027185	IC645	25-1942-45-00-00	.PUMP, FUEL	1
31	PAFZZ	PAFZZ	PAFZZ	PAFZZ		44940	SAEJ1508 D9	.CLAMP, HOSE	2
32	MFFZZ	MFFZZ	MFFZZ	MFFZZ		44940	04-20852-3	.HOSE, FUEL 5/32 INCH ID (MAKE FROM 40-10-0017 ON BULK ITEMS LIST CUT TO 220 MM +/-10)	1
33	XBFZZ	XBFZZ	XBFZZ	XBFZZ			04-21676	.PLATE OPERATING INSTRUCTIONS	1
34	PAFZZ	PAFZZ	PAFZZ	PAFZZ		38453	60-30-0025	.CAP, TUBE	1
35	XBFZZ	XBFZZ	XBFZZ	XBFZZ		44940	04-21503	.BRACKET, EXHAUST TUBE	1
END OF FIGURE									

## FIELD AND SUSTAINMENT MAINTENANCE

## AMMPS 30KW GENERATOR SET

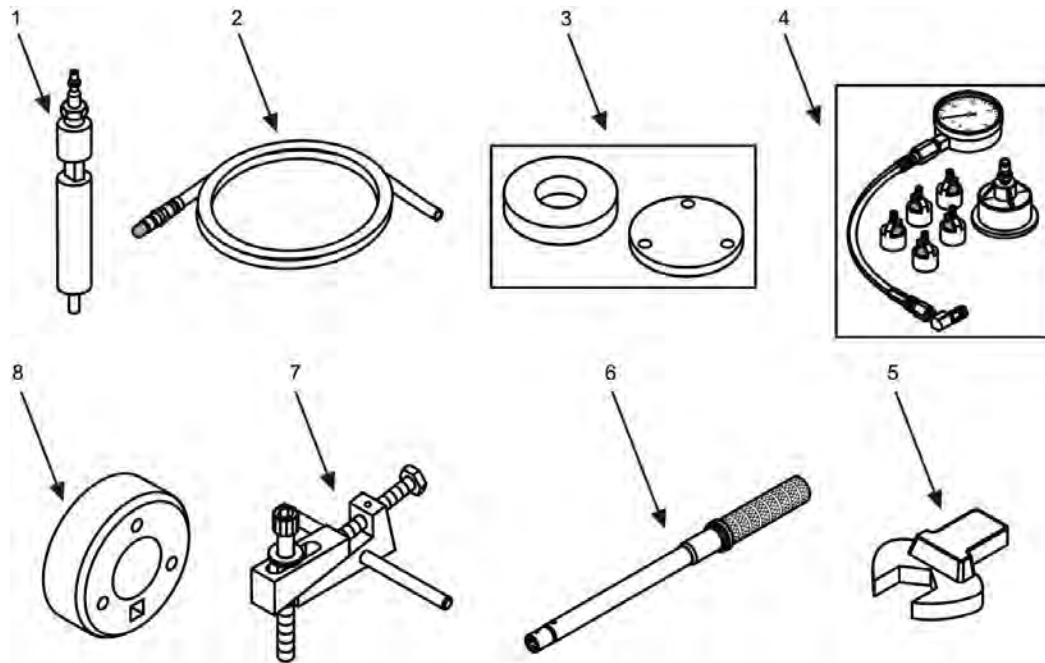
## BULK ITEM

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND UOC	(7) QTY
GROUP 99 BULK MATERIAL						
FIG. BULK						
1	PAFZZ		4AJA4	EF20C0038722	CABLE, ELECTRICAL	1
2	PAFZZ		4AJA4	EF20P0011939	CABLE, ELECTRICAL	1
3	PAFZZ		16428	889418	CABLE, POWER, ELECTRICAL	1
4	PAFZZ		16428	090130SWC8	CABLE, SHIELDED	1
5	PAFZZ	6145012530121	4AJA4	EF20C0028722	CABLE, SPECIAL, PURPOSE	1
6	PAFZZ		30554	88-22487	COATING	1
7	PAFZZ		30554	88-22802	COATING, PROTECTIVE	1
8	PCFZZ	5330015896527	C4643	A2539	EDGING	1
9	PCFZZ	5330015896559	C4643	A3521	EDGING	1
10	PCFZZ	4720015961228	24161	4219-0097	HOSE, NONMETALLIC	1
11	PCFZZ		24161	42190109	HOSE, NONMETALLIC	1
12	PCFZZ		47WU2	4230-0147	HOSE, NONMETALLIC	1
13	PCFZZ	4720015955507	73842	58001904800300	HOSE, NONMETALLIC	1
14	PCFZZ	4720200060172	38453	30-10-0003	HOSE, NONMETALLIC	1
15	PCFZZ	4720200061632	38453	40-10-0005	HOSE, NONMETALLIC	1
16	PCFZZ	4720200059979	38453	40-10-0017	HOSE, NONMETALLIC	1
17	PCFZZ	4720012443580	47WU2	4219-0102	HOSE, NONMETALLIC	1
18	PCFZZ	4720012085869	24161	4230-0134	HOSE, NONMETALLIC	1
19	PCFZZ		45152	3058529	HOSE, VENT	1
20	PAFZZ		92194	TFT-250-16	INSULATION, SLEEVING	1
21	PAFZZ		3SXL3	55PP02872757640064	INSULATION, SLEEVING	1
22	PAFZZ		81349	M3190/3-17-0	INSULATION, SLEEVING	1
23	PAFZZ			ST-301-1/4BLAC	INSULATION, SLEEVING	1
24	PAFZZ		28105	ST-301-3/16BLAC	INSULATION, SLEEVING	1
25	PAFZZ		28105	ST-301-3/4BLAC	INSULATION, SLEEVING	1
26	PAFZZ	5975015929768	30554	88-20541-1	INSULATION, SLEEVING	1
27	PAFZZ	8030000822508	05972	747-55	PRIMER, SEALING, COMPOUND	1
28	PAFZZ	4010015928570	0X4C9	3271-12-65	STRAND, WIRE	1
29	PAFZZ	4010015942186	0X4C9	3271-14-41	STRAND, WIRE	1
30	PAFZZ	4010015906749	0X4C9	3271-16-26	STRAND, WIRE	1
31	PAFZZ	4010015928567	0X4C9	3271-20-10	STRAND, WIRE	1
32	PAFZZ	4010015960040	0X4C9	3271-6-133	STRAND, WIRE	1
33	PAFZZ		0X4C9	3271-8-133	STRAND, WIRE	1
34	PCFZZ	2835015955886	C4643	A4025	SEAL, EDGE	1
35	PCFZZ	9390123827191	C4643	A1512	SEAL, EDGE	1
36	PCFZZ	5330123826622	C4643	A3709	SEAL, EDGE	1
37	PCFZZ	5330014566359	44940	508-0139	SEAL, PLAN	1
38	PAFZZ	8030014790487	05972	56541	SEALING COMPOUND	1
39	PAFZZ	8030013963362	05972	68035	SEALING COMPOUND	1
40	PAFZZ		44940	MIL-S-46163A	SEALING COMPOUND	1
41	PCFZZ	5970015942369	85901	ATUM 24/6-0	SLEEVE, HEAT SHRINK	1
42	PAFZZ	4720200062961	38453	60-30-0012	TUBE, FLEXIBLE	1
43	PAFZZ		30554	88-20444-2	WIRE, ELECTRICAL	1
END OF FIGURE						

END OF WORK PACKAGE



**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**SPECIAL TOOLS LIST**



**Figure 68. Special Tools List.**

(1) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER (NSN)	(4) CAGEC	(5) PART NUMBER (P/N)	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
SPECIAL TOOLS FIG. 68						
1	PAFZZ		15434	3164728	ADAPTER, COMPRESSION TESTER	
2	PAFZZ		15434	3164617	HOSE, FUEL RETURN FLOW	
3	PAFZZ		15434	3164900	INSTALLER, CRANKSHAFT SEAL	
	KFFZZ		0J1H4	30STTEKIT	KIT, AMMPS 30 KW STTE (NOT SHOWN)	
	KFFZZ		0J1H4	5-60STTEKIT	KIT, AMMPS COMMON STTE (NOT SHOWN)	
4	PAFZZ		47M91	3289	TEST SET, OIL SYSTEMS PRESSURE	
5	PAFZZ		15434	4818677	TOOL, FUEL PUMP RETENTION	
6	PAFZZ		0J1H4	01METRIC	TOOL, RIVET NUT	
7	PAFZZ		636D0	64-154	TORQUE TUBE, 5-75 FT-LB	
8	PAFZZ		636D0	64-309	TORQUE WRENCH HEAD END, 1/4" X 3/8" DRIVE, 5/8"	
END OF FIGURE						



**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**NATIONAL STOCK NUMBER (NSN) INDEX**

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5310000034094	27	35		22	11
4720000213320	1	35		65	42
5340000538994	65	114	3030005041371	42	11
5305000680500	27	11	5940005045877	16	13
	29	8		18	32
5305000680501	28	11	5310005501130	28	12
5305000680502	27	22		29	7
5305000680511	28	3	5340005505943	67	16
8030000822508	BULK	27	5940005577870	18	34
5310000877493	27	26	5310005590070	29	4
5940001130954	27	18	5310005825965	27	3
5940001139828	4	39	4730005951078	10	15
	11	14	5930006156731	6	14
5940001141314	27	23	5310006379541	28	4
5940001141315	66	4	5940006553318	4	46
4730001362018	34	16	5940006603633	20	46
5940001434771	65	8		22	8
	65	9	5930006831625	2	20
5940001434773	65	38	5940006886010	18	29
	65	43	5310007616882	27	2
5940001434777	28	7		29	11
5961001547046	29	13	4730008330508	12	10
3110001556298	27	14	5315008473531	28	1
5310001671344	29	14	4730008716729	10	16
5325001850001	10	17	5975008783791	1	28
5310001898467	17	17	5940008799509	66	2
5940002300515	29	12	5940008990260	16	16
5940002372703	17	18		18	44
5940002376779	66	9	5320009321972	1	6
5305002535615	27	19		4	11
5305002692803	27	29		67	13
5305002693241	27	25	5310009349757	29	5
5325002708890	10	22	5305009846196	29	1
	34	10	5305009881727	29	9
5940002835281	65	84	5305009881728	27	4
5310003382255	6	27	5940010038579	17	19
	7	5	4730010554021	31	1
5340004044098	13	18	5961010679493	29	15
	13	20	5340010813419	34	7
	65	110		34	8
5340004044100	65	113	5935010979974	2	17
5340004256432	10	44	5940011129746	65	29
	65	111		65	30
5940004640117	1	39	5940011390853	20	44

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
4730011659491	36	25	5120013754373	4	44
	44	2	6140013788232	2	8
5310011688140	2	15	2920013882776	4	27
5935011741235	18	39	5935013897312	65	5
	19	10	5340013960454	4	57
	20	35	8030013963362	BULK	39
	22	19	4730014079298	10	41
	65	44	5935014142582	65	14
5935011862240	65	10	5310014358312	23	2
5340011917772	66	17	5935014468180	24	34
5305011937594	65	88		65	36
5999012036687	18	38	5935014475814	24	32
	19	11		65	35
	20	20	4730014491233	67	22
	22	18	6130014493311	26	4
	24	33	5935014541789	22	17
	65	32	5365014545474	55	10
4720012085869	BULK	18	5330014566359	24	11
4730012089235	12	6		BULK	37
5999012163648	24	49	5945014586605	20	31
5315012229228	28	2	5310014664926	17	13
4720012443580	BULK	17	5340014681767	4	12
4730012456925	34	14	5970014701630	65	7
5935012502524	65	4	5935014701978	65	89
6145012521449	20	23	5310014702044	17	12
6145012530121	65	37		18	12
	BULK	5	5935014702406	65	102
5999012801438	65	97	5999014706330	65	101
5305012838664	27	34	5340014706383	67	25
2920012986321	28	10	5935014708342	19	12
5340013022960	29	2		65	31
5935013088599	65	18	5935014708343	65	105
5310013213478	25	6	5305014729826	24	3
5999013234929	65	16	5310014730397	25	7
5935013250384	65	13	5310014773397	24	13
5970013261733	65	6	5305014773402	24	46
5310013267487	24	47	5310014773448	25	5
	26	2	5305014773485	24	14
5905013291699	25	3	5310014773488	26	6
5310013331883	27	5	5305014773499	24	16
5310013354861	36	20	5310014773500	24	15
	38	17	5306014773519	24	23
5935013399574	65	65	5365014775088	24	24
	65	66	8030014790487	BULK	38
5975013604293	65	78	5935014791567	65	48
4820013671836	10	13	5935014791823	65	24
	31	3	5935014802382	65	104
5331013697318	27	13	5985014802392	65	103
5999013734494	65	94	5331014812514	36	18



STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
	55	12	4730015092576	46	4
5935014830852	18	41	5330015092599	59	3
	20	21	4730015093024	36	10
	65	46	5331015093685	41	2
5935014846537	18	40	5340015094088	36	13
	20	19	4730015094999	33	4
	65	45	2930015095000	33	6
5310014849183	16	2	4730015095003	33	8
	22	2	5305015095005	37	2
5935014953346	22	23	4730015095008	33	3
5935014953353	22	20	4730015095011	33	5
5310015006541	4	58	4730015095018	33	1
5935015033305	65	58	5305015096083	59	13
5935015065555	24	48	5305015097929	36	21
	65	41		38	33
9905015082346	49	2	5310015097933	64	6
5930015083767	51	13	5310015097934	36	11
	51	15	5310015097935	39	4
6685015089059	40	3	5340015097937	55	5
3120015089060	58	10	4730015097968	33	2
5330015089094	36	3	2940015098381	33	7
2815015090452	55	16	5310015098383	37	8
3040015090456	59	5		64	11
5305015090458	52	11	5365015098760	53	9
5305015090459	54	12	5310015098762	53	7
5330015090463	60	1	5310015098765	36	2
5310015090464	59	9	5310015098766	53	8
5330015090465	52	3	5360015098768	54	4
5330015090466	53	4	2590015099115	53	13
5331015090468	47	5	2930015099118	40	1
2815015090479	54	13	5330015100103	40	5
2815015090480	47	1	5330015100104	64	9
2815015090482	64	1	5305015100772	45	2
4710015090487	47	4		50	4
5340015090500	54	6	5305015100796	36	15
5340015090502	54	9		41	8
5340015090503	54	7		47	6
5315015090877	52	5		50	22
5305015090890	54	10	5305015100798	38	11
5310015091246	54	2		41	9
5365015091247	36	16	5305015100850	38	15
5365015091248	63	3		46	3
	63	4	5305015100857	43	3
5305015091582	39	6	5305015100865	64	10
	64	4	5305015100867	31	7
5360015091588	52	2	5305015102843	54	11
5340015091596	64	7	5310015104529	37	5
4730015092572	55	9		38	31
4730015092573	64	8	5325015106068	57	8

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5310015106151	47	3	5935015716514	65	56
5315015106191	59	4	5999015722092	65	25
5307015106202	36	4	9320015801153	65	64
5935015121010	20	36	5999015821957	65	59
	65	98	5325015851529	17	3
5310015140168	26	5	5935015859802	65	82
5310015152283	65	49	6110015859960	6	22
5940015181334	65	69	6150015860026	1	36
5935015191808	24	50	5940015860213	19	6
	65	39		20	40
5935015224172	20	33	5925015860232	20	13
	65	96	5998015860344	22	3
5935015231411	65	51	6150015860411	19	5
5935015235410	65	47	6150015860561	20	18
5935015238855	19	9	5340015868449	65	17
	65	33	5340015868472	65	106
5940015273588	65	70		66	20
	65	71	4320015870865	12	11
5305015332163	27	12	5980015873102	6	23
6130015332167	28	9	5330015876259	6	28
6115015332172	28	13	5935015877601	65	53
5325015332174	28	8	5935015877612	65	28
6685015354250	51	8	5998015877618	7	10
5331015357774	51	14	5340015878549	20	11
5340015408655	65	54	2930015882852	10	20
5342015433212	11	5	5340015883111	7	3
5935015518077	20	34	5999015883447	12	13
5310015531219	23	6	5340015883558	67	14
2990015564239	51	10	6150015883988	7	15
2990015564240	51	16	6150015883992	7	14
5310015577264	32	13	6150015883995	7	13
5940015600703	65	55	6150015884000	6	30
6115015617718	1	1	5307015884044	15	8
6115015617738	1	2	6115015884725	5	3
5331015635629	51	11	6150015885103	7	12
	51	18	6150015885253	7	11
2990015669773	51	12	5935015885256	65	27
2990015669774	51	17	5935015885261	65	72
5925015694427	3	3	5935015885541	6	29
5925015696394	3	5	5999015885580	65	57
5935015699460	65	79	5935015885600	6	32
5935015699470	65	80	6150015885606	6	6
5935015699506	66	18	6150015885621	6	3
5935015699542	65	77	6150015885631	6	21
5935015703453	66	15	6150015886024	6	11
5935015704538	65	68	5975015886200	67	9
5935015704557	66	16	6145015886489	17	21
5925015715799	3	4	5999015886563	65	117

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
6145015886588	65	120	5935015906702	20	24
5998015887145	7	7	5975015906706	12	9
5998015887279	6	33	4010015906749	18	24
5305015889321	4	17		20	42
	5	16		20	50
4730015890851	11	34		20	52
4820015891015	11	45		BULK	30
5340015891081	65	81	5940015907509	18	13
5310015893727	3	9	5365015908328	22	4
	4	4	2815015908774	11	32
	8	2	2815015908778	10	28
	10	2	2815015908812	10	26
	11	3	2815015908815	14	3
	15	5	2815015908820	8	12
	17	9	6150015909899	18	27
	21	2	6150015909906	18	22
5325015893727	32	8	4820015910618	34	19
	34	23	4730015914508	11	49
4730015893753	11	19	2990015914741	13	9
4910015893803	4	23	5340015914993	4	56
4910015893807	4	24	5310015915002	24	6
6110015893950	43	1	2815015915173	13	15
5961015893954	26	1	2815015915186	9	2
5930015894070	6	15	2815015915191	34	4
5310015894140	11	8	6110015915195	16	4
	17	16	4730015917731	34	1
5935015894365	11	50	4730015917746	13	5
5340015894472	6	24		34	17
5340015894619	66	22	5305015919022	32	5
	67	11		39	8
5330015894656	6	9		50	10
5330015894667	19	4		65	108
5925015894819	2	22		67	26
5340015894823	9	4	5305015919045	11	48
5330015896527	BULK	8	5305015919049	16	11
5330015896559	BULK	9	5305015921166	11	52
5365015897359	55	11	5305015921168	4	52
5340015899949	23	4		5	1
5340015899988	5	13		8	3
5340015900063	4	34		10	43
5330015900070	7	9		13	19
5930015900170	20	27		16	6
6150015900171	18	55		17	4
5365015900371	4	26		18	21
5340015901601	6	12		20	8
2815015905312	10	19		21	3
5999015905769	65	40		32	9
	65	95		53	12
2815015906391	10	21		65	107

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
	66	19	2815015957354	10	5
	67	10	4730015957417	67	6
5310015928026	43	2	4710015957532	13	16
5305015928036	18	2	2815015958952	62	1
	18	45	2910015959022	37	3
4010015928567	BULK	31	2910015959085	39	5
4010015928570	BULK	28	2815015959101	38	32
5975015929768	BULK	26	4820015959185	52	6
5340015933798	20	9	2815015959226	62	5
2530015934686	56	1	2910015959235	39	1
5310015935320	6	16	6150015959236	2	14
5940015938312	25	4	2815015959382	57	7
4730015938468	34	5	6150015959390	2	6
5935015938640	65	60	4710015959402	38	9
5935015938658	65	61	2815015959416	58	1
4320015939606	63	2	4710015959420	38	8
4010015942186	65	67	2815015959429	52	7
	BULK	29	4710015959440	38	7
5970015942369	BULK	41	4710015959450	38	6
6115015954216	24	1	2815015959458	57	2
5925015954319	20	14	4710015959463	38	10
6145015954654	65	116	2920015959464	42	7
2815015954680	61	2	4730015959472	38	3
5310015954930	16	8	2815015959480	55	2
5935015954970	65	100	6150015959484	2	12
5305015955409	24	5	2950015959537	36	1
4720015955507	BULK	13	3020015959538	61	1
6610015955704	54	3	4730015959550	38	13
5975015955716	38	14		39	7
5995015955733	50	1	4010015960040	BULK	32
6120015955747	62	7	4720015960053	38	19
5340015955878	9	6	5310015960059	11	40
2835015955886	BULK	34	4720015960081	38	35
5305015956003	4	59	4720015960175	36	23
	7	2	4710015960197	38	26
5305015956010	7	6	4710015960217	38	22
5305015956135	7	16	3040015960310	42	3
5330015956147	5	7	4730015960477	38	21
5330015956168	6	10	5305015960483	24	52
5330015956467	6	8		27	38
2910015956561	13	8	5305015960494	24	54
5340015956688	38	5	3020015960520	37	7
6150015956739	2	1	2910015960527	35	7
4720015956776	8	4	4730015960532	36	22
5935015956861	20	15	2990015960562	44	1
5310015957022	24	8	5330015960564	36	5
2990015957072	17	2	5305015960570	45	3
4720015957088	10	33	4730015960728	38	12
4720015957305	13	17	4720015961228	BULK	10

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
4730015961298	32	3	5310015967778	37	9
5305015961447	6	17	5340015967780	38	28
2930015961473	10	7	5315015967783	25	1
5305015963571	24	9	5340015967785	36	27
5345015963576	34	6	5305015967786	50	13
5305015963579	23	16	5310015967787	35	6
5310015963624	16	7	5330015967788	35	4
5310015963627	15	6	5340015967789	38	1
5305015963670	10	9	5365015967790	41	5
	12	14	5340015967792	36	24
	14	4	5315015967793	62	6
	67	18	5315015967794	38	20
5305015963678	20	57	5340015967795	35	3
	21	6	5307015967797	37	4
5310015963732	20	3	3020015967798	58	4
5310015963734	20	10	3020015967799	59	6
5310015963750	15	7	3020015967800	62	2
5310015963757	24	53	5340015967801	38	34
	27	37	5340015967802	38	4
2910015963766	34	26	5305015967803	36	9
5310015963771	16	9	5305015967804	35	5
5331015964575	36	28		50	5
5305015964641	26	3	5305015967805	50	27
5305015964658	61	3		63	5
5305015964675	56	4	5305015967806	36	17
5305015964677	54	5	5305015967808	38	2
5330015964681	41	3	5305015967809	44	4
4730015966452	12	19	5315015967810	62	4
4730015966482	32	10	3040015967813	54	8
5315015966490	55	3	3120015967814	58	6
3120015966495	56	5	5315015967815	58	3
5305015966500	61	5	5315015967816	55	13
4720015966552	12	8	5330015967817	36	8
3120015966630	58	7	3120015967818	58	5
5305015966633	50	19	5330015967819	46	2
5331015966637	37	6	5330015967820	52	10
5340015966641	52	4	3120015967822	58	9
5340015966650	36	14	5340015967823	61	4
5340015966925	23	11	5330015967865	44	5
5305015967033	3	7	4730015968124	38	25
	15	1	4730015968128	38	18
4730015967215	67	3	4730015968129	38	23
4730015967452	36	19	3110015970652	25	14
5310015967544	24	12	6160015970887	2	7
2815015967562	30	1	6115015970915	24	7
6150015967691	65	2	3040015971148	4	21
3950015967774	48	1	5930015971176	65	63
5365015967776	39	3	6160015971208	2	3
5310015967777	42	2	2930015971233	10	8

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STOCK NUMBER	FIG.	ITEM
5915015971364	6	20
5340015971365	17	6
5340015971375	5	12
5365015971376	12	18
5330015971377	11	41
5330015971378	5	5
5340015971379	5	9
5340015971380	4	19
4730015972886	55	7
5340015973073	4	61
5340015973082	4	32
5305015973109	50	12
4720015973414	8	22
6160015973421	2	4
6105015973426	25	2
4320015973680	24	43
4810015976397	25	13
4730015979059	11	4
5305015980197	18	3
	67	28
6620015982271	31	9
5330123826622	BULK	36
9390123827191	BULK	35
2910200027185	67	30
4720200059979	67	24
	BULK	16
4720200060172	BULK	14
4720200061632	BULK	15
5340200062750	67	17
4720200062961	BULK	42
5310332082057	65	112
5310993711050	19	13

**END OF WORK PACKAGE**

**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**PART NUMBER INDEX**

<b>PART NUMBER</b>	<b>FIG.</b>	<b>ITEM</b>	<b>PART NUMBER</b>	<b>FIG.</b>	<b>ITEM</b>
A003C918	24	26	A034R862	24	37
A004T342	24	22		27	41
A005X534	24	28	A034S429	24	40
A005Y870	24	18		27	44
A007A677	24	38	A035B152	25	8
	27	42	A035B156	25	10
A007L156	24	42	A035J009	24	35
	27	46		27	39
A007L160	24	20	A1512	BULK	35
A007L363	24	19	A206D375	6	7
A025H476	24	41	A2539	BULK	8
	27	45	A3521	BULK	9
A026B892	6	28	A3709	BULK	36
A026D370	6	33	A4025	BULK	34
A026D949	7	7	AA55804-3B 9FT	1	28
A026E707	7	16	A-A-59585-212JCB E	27	14
A026E709	7	9	AEB02C500C50WA6FY1	23	1
A026F118	20	59	AEN045M508000CX0A36	5	15
A026F119	21	4	AEN04M508000CX0A36	4	22
A026F215	7	10	AEN12F250000CH2A31	16	7
A026G000	3	7	AEN15M10C000WA2AA1	15	6
A026G053	6	24	AEN18M10C000DG8A31	11	26
A026H036	24	44	AES01C025Z7A32	11	24
A026H878	24	51	AES01C375625BS8A11	18	16
A026J177	6	10	AES07M06A016M4A21	12	14
A026J180	6	8	AES07M06A018UB5A11	16	11
A026J182	6	9	AES07M06A070WB4AA1	11	38
A026K415	25	11	AES07M10C020CG7JH1	27	38
A026K421	25	14		24	52
A026K431	22	3	AES07M10C030CG2K41	24	54
A026K584	24	30		65	119
A026L569	24	43	AES10M06A012WB4K42	67	20
A026L688	24	29	AES10M06A016WB4K42	11	29
A029F701	24	17		4	5
A030A105	6	18		8	3
A030D423	6	22		10	9
A030Z836	24	25		14	4
A034G137	24	21		67	18
A034G864	24	27	AES10M06A020WB4K42	13	19
A034P825	24	39		16	6
	27	43		17	4
A034P849	24	36		18	21
	27	40		20	8

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
	21	3	AEW20X010000BD8A21	15	7
	4	52	AEW22X190000EA1AA1	12	5
	5	1	AEW22X500000EA1AA1	43	2
	11	52	AEW23X06R10MSE4A31	4	16
	15	1	AEW24X37N062BD6FY1	24	53
	32	9		27	37
	65	107	AEW25X266031UB5A11	16	9
	66	19	AEW25X266062EA1AF1	11	39
	67	10	AEWX26X19RUA2A11	18	19
AES10M06A020WBK42	53	12	AF26117	8	9
AES10M06A025WB4K42	10	43	AH1948900	8	8
	65	115	ALS4-610-6.6	17	3
AES10M06A030WB4K42	18	3	AN315-4R	29	14
	67	28	ATUM 24/6-0	1	38
AES10M06A050WB4K42	18	2		BULK	41
	18	45	B1821BH038C125N	28	3
AES10M06A055WB4K42	20	57	B1821BH038F175N	27	25
	21	6	B1834C06030N	17	11
AES10M06AD40WB4K42	13	12	B-718817-01	29	3
AES10M08B016WB4K42	8	5	B718930-01	29	16
AES10M08B020WB4K42	34	6	BX509013-2050	42	11
AES10M08B030WB4K42	34	27	C0105031845	61	5
AES10M08B080WB4K42	42	12	C0105061430	64	10
AES10M10C020WB4K42	32	5	C0112460825	36	4
	39	8	C0143500616	36	9
	50	10	C0143500625	38	2
	65	108	C0143500812	61	3
	67	26	C0143500814	36	15
AES10M10C025WB4K42	23	16		41	8
AES10M10C030WB4K42	13	2		47	6
	23	3		50	22
AES10M12D030WB4K42	23	8	C0143500816	38	27
AES1F190625BS8A11	18	18		47	2
AES46M06A018WA3A11	20	55		50	25
AES46M06A018WA3A41	18	52		59	10
AES46M30540NWA3A41	18	54		63	1
AES46M407010WA3A41	2	23	C0143500820	40	2
AES47M4D7016DG6CP2	11	42		51	9
AESF5C112312WA2A26	6	31		62	9
AESZAC190375WA1FY1	11	48	C0143500825	50	27
AEV28X120500BEZA11	18	8		63	5
AEW13X164000GD5A21	20	3	C0143500830	50	26
AEW13X250000GD5A21	20	10	C0143500835	50	19
	4	40	C0143500840	35	5
	5	2		50	5
	11	35	C0143500850	36	17
	12	12		41	9
AEW20M010000DB8A31	65	109	C0143500855	41	6
AEW20M10C000DB8A31	11	25		50	16



PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
	59	12	C6136311431	61	4
C0143500860	59	13	C6136521620	55	6
C0143500865	54	11	C6140116331	40	5
C0143501016	51	6	C6140211130	55	3
C0143501020	23	12	C6140211341	64	9
	31	7	C6150816920	50	15
C0143501025	38	16	C6201115850	36	2
	42	5	C6202435320	54	4
	62	8	C6204111840	52	10
C0143501035	38	11	C6204114850	44	5
C0143501045	38	15	C6204116421	40	1
	46	3	C6204118610	53	13
C0143501065	45	2	C6204118810	53	4
	50	4	C6204131610	52	11
C0143501070	44	4	C6204213510	60	1
C0143501075	45	3	C6204214230	64	5
C0143501235	43	3	C6204215112	47	1
C0158400806	37	5	C6204215180	64	7
	38	31	C6204218100	58	7
C0164330823	47	3	C6204218110	58	8
C0401000516	62	4	C6204218120	58	9
C0402000820	55	4	C6204218500	58	6
C0402001228	55	15	C6204218510	58	5
C0402500408	55	14	C6204313310	56	4
C0402500512	59	4	C6204313410	56	7
C0406503012	57	8	C6204314193	64	2
C-04-21420	4	59	C6204314510	64	1
C-04-21421	5	7	C6204314520	64	3
C0441802550	53	5	C6204316331	59	5
C0700002085	31	5	C6204316350	59	9
C0700003040	41	2	C6204411131	62	3
C0700501212	38	24	C6204412110	55	16
C0704200415	64	8	C6204413110	54	13
C0704220108	46	4	C6204414410	52	2
C0704270312	55	9	C6204414510	52	4
C0728100259	33	2	C6204414520	52	5
C0728100289	36	22	C6204414541	52	3
C0V-0613	10	44	C6204414550	52	9
C2055475870	42	3	C6204415110	54	6
C22275-020-4	67	14	C6204415120	54	9
C6002112110	33	7	C6204415620	54	7
C6004216120	40	4	C6204415710	54	12
C6008152341	44	1	C6204511620	55	8
C6130121961	42	8	C6204511711	55	7
C6130321361	37	8	C6204516122	47	5
	64	11	C6204516130	47	4
C6136118120	53	7	C6204816321	42	14
C6136118130	53	8	C6204816740	42	13
C6136118142	53	9	C6205115580	36	3

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
C6205115670	36	6	CV5060700	34	26
C6205115811	46	2	CV50612	34	25
C6205435300	54	1	D38999/26WH21SN	65	13
C6205435310	54	5	D38999/26WJ29SN	65	4
C6205435410	54	3	D38999/26WJ61SN	65	10
C6205435500	54	8	DIN125-M3	19	13
C6205516850	36	16		20	17
C6205517611	36	8	DIN126-M5	11	47
C6205518251	36	10	DIN126-M10	24	55
C6205518450	36	23	DIN6923-M4	16	5
C6205518490	36	13		20	4
C6205518560	36	14		22	6
C6205615251	33	5	DIN6923-M6	2	5
C6205615261	33	1		4	20
C6205615271	33	4		5	8
C6205615281	33	3		11	15
C6205615400	33	6		12	16
C6205615410	33	8		18	4
C6206213840	59	3		20	5
C6206213930	37	2		34	9
C6206311530	58	3		53	10
C6206611731	41	3		65	112
C6207211190	55	13		66	21
C6207414130	52	7		67	7
C6207511610	63	3	DIN6923-M8	8	6
C6209414210	52	6		9	3
C6221415410	54	10		34	24
C6221415420	54	2		49	3
C6691418230	63	4	DIN6923-M10	13	3
CD042256C	1	41		48	2
CD3101E18-195	1	43	DIN7380A2-M5X25	2	19
CD3106E18-19P	1	37	DIN7380A2-M6X12	4	18
CD389/26WH21SN-BS23	65	12		5	10
CD389/26WJ29SN-BS25	65	3		11	6
COV-0613Z1	65	111		20	12
COV-0813	65	106	DIN7985-M2X3	6	25
	66	20	DIN912-M10X25	27	36
COV-1313	13	20	DIN931-M4X16	16	1
	34	7		20	1
COV-1713	13	18	DIN931-M4X6	22	1
	65	110	DIN931-M5X30	12	4
COV-2013	66	22	DIN931-M12X50	23	10
	67	11	DIN933-M3X16	19	1
COV2113	65	113		20	26
COV-3313	34	8	DIN934-M3	19	14
CT150E24E2S	16	4		20	16
CUM1196	8	17	DIN934M5	2	15
CUM1198	8	15	DR20BLKWRTR	20	15
CUM1199	8	19	DRC26-50S04	65	28

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
DRC26-60S06	65	99	M85049/39-25W	65	5
DT04-2P	24	48	MEP-1060	1	1
DT04-3P-P007	65	104	MEP-1061	1	2
DT04-4P-EP13	65	47	MIL-S-46163A	BULK	40
DT06-08SA	65	53	MMF1203M06F16M4	22	4
DT06-2S	24	32	MN127100-3761	8	13
	65	35	MS122916	67	16
DT06-35-P006	65	103	MS20066-356	28	1
DT06-3S	19	9	MS20066-358	28	2
	65	33	MS20659-10	18	29
DT06-3S-E008	65	102	MS20659-29	66	9
DT06-4S	18	40	MS20659-41	4	46
	20	19	MS20659-129	27	23
	65	45	MS20659-142	66	4
DTP06-4S	20	33	MS20659-165	27	18
	65	96	MS21318-21	27	19
EF20C0028722	65	37	MS21333-126	65	114
	BULK	5	MS24523-31	2	20
EF20C0038722	65	34	MS25036-103	65	8
	BULK	1		65	9
EF20P0011939	65	91	MS25036-105	65	38
	BULK	2		65	43
EM4D147	65	117	MS25036-109	65	84
EM4E393	65	120	MS25036-148	4	39
EM4H710	17	21		11	14
EM4M200	65	116	MS25036-154	29	12
F51N7582-813	23	6	MS25036-155	20	46
FA1493FFF3000	1	35		22	8
FF-W-92 TYPE A CLE GRI	18	15	MS25036-157	28	7
FSCMN-01	12	3	MS25043-16DA	6	2
GH60-04G-B-LF	65	74	MS25043-18D	20	25
HAB-80-S	2	13	MS25043-18DW	6	12
HD10-9-1939P	65	89	MS25043-20DA	6	13
HDC16-9-L47N	65	93	MS25224-1	6	14
IUG66-1-43-10.0-AB-01	18	55	MS25281-4	29	2
J515CH29X0386H	12	2	MS27183-13	27	26
JANTX1N1190	29	13	MS27183-49	27	5
JANTX1N1190R	29	15	MS3102R18-19SN	20	24
JM86LC6SS6R	67	25	MS3212-13L	65	88
JSKG12	10	8	MS35206-248	29	1
K3-2347-52	4	12	MS35206-283	29	9
M24243/6-A402H	1	6	MS35206-287	27	4
	4	11	MS35333-38	29	4
	67	13	MS35333-40	28	12
M3190/3-17-0	BULK	22		29	7
M45938-1-4C	6	27	MS35338-44	27	3
	7	5	MS35338-48	27	35
M6CNNEBR/985	16	8	MS35489-22	10	22
M85049/39-23W	65	14		34	10

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
MS35489-46	10	17	SAEJ5145-4070202 C	11	44
MS35649-282	29	5		13	4
MS39347-5	17	18	SAEJ5145-6070220 C	12	1
MS51831B201	18	6	SAEJ5146070202C	13	1
MS51967-2	27	2	SAEJ5146-4080102 C	12	10
	29	11	SAEJ5146-8070202 C	14	2
MS90725-110	27	34	SAEJ5148-6140139C	67	9
MS90725-5	28	11	SAEJ5302-2130239 B	10	24
MS90725-6	27	22	SAEJ5306-6130339 B	10	35
MS90726-60	27	29	SAEJ5308-6130139 B	10	36
NL6448BC20-21C	6	23	SAEJ1508CTB-27	67	3
P35900661	11	34	S-M4-1ZI	4	9
P4055-5001-1	31	9	SOS-85.1-12	7	3
PLT4S-M30	2	11	SP101200JF	32	2
	18	51	SP2529VT	10	13
PR11-42-15.0A-XX-V	20	14		31	3
PR11-62-15.0A-XX-V	20	13	ST-301-1/4BLAC	65	76
Q065571-10	8	10		BULK	23
Q458222A	34	19	ST-301-3/16BLAC	65	7
R25T	13	8		BULK	24
RK55617	13	9	ST-301-3/4BLAC	65	73
RS62200	11	40		BULK	25
SAE J1508 D11	67	23	T92S11D22-24	20	31
SAE J514 5-6 070120C	12	6	TAG22T3-100B	20	49
SAE1508F56	8	11	TAG26T6-100B	18	37
SAEJ123112-8430260B	67	8	TAG2T5-100B	4	38
SAEJ12314-843146 0B	34	13		11	13
SAEJ12318-124301 60B	10	37		18	25
SAEJ1508 D9	67	31		19	8
SAEJ1508CTB-15	13	5		20	22
	34	17		22	10
SAEJ1508CTB-16	32	3		65	22
SAEJ1508CTB-19	34	11		65	23
SAEJ1508CTB-22	34	1	TAG3T3-100B	65	21
SAEJ1508CTB-27	10	38	TAG3T3-100B	1	40
SAEJ1508CTB-32	34	4	TAG9T3-100B	16	15
SAEJ1508CTB-42	10	32		18	31
SAEJ1508CTB-47	10	25		20	38
SAEJ1508CTB-58	10	31		22	16
SAEJ1508CTB-61	10	27		65	19
SAEJ1508F72	11	18		66	11
SAEJ1508SLF36	8	14	TFT-250-16	65	6
SAEJ1508SLF44	8	21	TFT-250-16	BULK	20
SAEJ1508SLF52	8	20	UD0275A1	9	4
SAEJ5144070221C	12	9	US0094#02#EA	6	4
SAEJ5144140109C	13	11	US9206#01 EFI	6	5
SAEJ5144-6070220 C	12	7	VT10321	9	6
SAEJ5145070118C	11	9	W12S	22	17
SAEJ5145070801B	11	7	W2P	24	50

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
	65	39		44	2
W2S	24	34	3058529	BULK	19
	65	36	3092085	39	3
W3G300-ER38-47	10	42	3092299	38	18
W3S	19	12	3092334	38	14
	65	31	3093730	42	15
W4S	18	41	3093782	55	5
	20	21	3093844	64	6
	65	46	3093980	39	4
W8S	65	51	3094020	36	21
WP-4S	20	36		38	33
	65	98	3094065	36	11
XV501P-12	32	6	3094512	50	12
XV502P-4-04	11	45	3094937	42	9
1552	18	34	3335076	42	2
6202	10	16	3609867	49	2
25960	20	30	3678923	55	10
25970	20	29	3678924	55	11
33462	66	2	3678925	36	18
36152	1	39		55	12
	22	11	3800872	58	10
	65	42	3800884	40	3
36808	16	13	3863143	42	6
	18	32	3863271	37	9
44832	2	9	3863313	50	7
	4	2	3863343	42	1
44832	20	7	3863772	38	29
44832	34	21	3863942	38	28
56541	BULK	38	3864014	50	23
60225	6	16	3864114	38	23
62200	10	21	3864273	38	32
68035	BULK	39	3864469	51	2
81683	19	4	3864473	50	28
85295	16	2	3918192	36	20
	22	2		38	17
89418	20	23	3918686	36	26
114017	18	39	3918951	36	27
	19	10	3918952	36	28
114017	20	35	3925344	39	6
114017	22	19		64	4
	65	44	4076930	51	13
114018	66	17	4076931	51	15
130207	4	36	4095528	50	8
	11	11	4095839	50	13
321598	16	16	4095890	50	9
	18	44	4096340	50	2
889418	BULK	3	4921574	51	14
1788880	65	18	4921684	51	16
3008465	36	25	4921685	51	12

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
4921686	51	10	4941184	46	1
4921687	51	17	4941185	36	5
4928599	51	11	4941190	59	7
	51	18	4941198	39	2
4933756	50	24	4942437	39	5
4934062	38	4	4944247	52	1
4941107	52	8	4944438	58	2
4941109	35	2	4944443	57	7
4941111	35	6	4944458	59	11
4941112	35	4	4944469	53	3
4941114	55	1	4944472	41	5
4941115	55	2	4944473	41	10
4941133	59	1	4944475	56	1
4941134	59	2	4944478	56	3
4941136	58	1	4944479	56	2
4941137	58	4	4944480	56	5
4941138	57	2	4944481	56	6
4941139	57	6	4944539	61	1
4941140	57	3	4944557	44	3
4941141	57	5	4944843	51	5
4941142	59	6	4944845	51	1
4941144	62	7	4944849	35	3
4941145	62	2	4944852	36	1
4941146	62	1	4944853	36	12
4941147	62	5	4944855	36	7
4941148	63	2	4944866	53	2
4941151	41	4	4944868	50	1
4941152	38	3	4944941	38	34
4941153	38	9	4944942	38	30
4941155	38	8	4944943	38	35
4941156	38	7	4944945	37	4
4941157	38	6	4944947	37	6
4941158	38	10	4944952	38	25
4941159	38	26	4944961	50	21
4941160	38	12	4944962	36	24
4941161	38	22	4944968	50	20
4941162	38	5	4944969	50	6
4941163	39	1	4944970	50	17
4941164	38	19	4944971	50	3
4941165	38	21	4944972	50	14
4941166	38	20	4944976	50	18
4941168	45	1	4944979	51	3
4941169	53	1	4944981	51	4
4941170	53	6	4944992	62	6
4941173	37	3	4944993	38	1
4941174	37	7	4944998	59	8
4941175	37	1	4945721	57	4
4941178	51	7	4945839	42	7
4941179	61	2	4946720	50	11

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
4948534	43	1	04-20019	4	64
4954905	51	8	04-20021	4	6
4955415	35	1	04-20023	4	76
4955416	57	1	04-20049	9	5
4955417	41	1	04-20053	12	8
4955996	55	17	04-20105	20	56
4981453	35	7	04-20109	20	58
4984028	36	19	04-20118	34	15
4988821	49	1	04-20160	30	1
4990890	41	7	04-20162	32	7
11674728	2	17	04-20166	32	10
12010300	65	65	04-20181	6	19
	65	66	04-20202	11	22
12015899	65	78	04-20203	11	23
12065287	65	58	04-20209	3	1
12077411	65	70	04-20232	19	2
	65	71	04-20236	17	10
12077412	65	69	04-20246	20	6
12089188	65	16	04-20248	20	11
12089290	65	59	04-20255	20	18
12129414	66	13	04-20257	20	32
12191818	65	83	04-20275	16	12
12421882	65	105	04-20276	16	17
12422624	65	41	04-20277	16	18
15324980	65	64	04-20278	18	48
15324982	65	17	04-20279	18	46
15326808	65	82	04-20280	18	42
15336703	66	15	04-20283	4	51
15355390	66	14	04-20285	4	50
15366021	65	81	04-20290	4	25
42190109	BULK	11	04-20306	4	33
58001904800300	BULK	13	04-20312	4	56
0130-8256-2-010L	10	7	04-20313	5	12
0149-2769	12	11	04-20345	23	14
0200-3167-01	24	1	04-20346	23	13
0201-3434-01	25	2	04-20357	11	32
0201-3472-02	25	12	04-20364	17	6
0231-0318	24	10	04-20380	11	1
0232-3441	24	12	04-20385	6	15
0232-3730-03	24	24	04-20398	4	31
0234-0903	24	2	04-20399	5	9
0304-0807	25	3	04-20406	12	18
0332-2980-05	25	4	04-20411	6	29
0332-3831-01	24	31	04-20412	6	32
04-20009-1	1	24	04-20414	5	4
04-20009-2	1	25		6	1
04-20009-3	1	26	04-20421	6	6
04-20013	65	1	04-20422	6	3
04-20015	4	42	04-20424	5	6

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
	7	1	04-20885	13	13
04-20434	7	14	04-20886	23	15
04-20435	7	15	04-20887	23	17
04-20436	7	13	04-20901	18	33
04-20437	6	30	04-20902-3	22	5
04-20438	7	12	04-20902-4	15	9
04-20439	7	11	04-20906	17	8
04-20441	6	11	04-20913	18	7
04-20442	5	3	04-20922	20	41
04-20453	19	5	04-20923-1	18	27
04-20456-1	15	2	04-20923-2	18	22
04-20456-2	15	3	04-20961	21	1
04-20502	11	33	04-20963	10	28
04-20535	11	43	04-20964	10	26
04-20536	11	41	04-20965	10	33
04-20586	2	7	04-20966	10	30
04-20587	1	45	04-20967	10	34
04-20601	4	54	04-20968	10	29
04-20602	4	30	04-20969	6	26
04-20606	1	44	04-20976	8	22
04-20613	12	17	04-20982	20	51
04-20617	11	28	04-20988	22	7
04-20618	12	19	04-21011-4	1	14
04-20622	12	15	04-21016	1	29
04-20634	15	4	04-21017-2	1	32
04-20644	11	31	04-21022-7	1	17
04-20645	2	16	04-21022-8	1	18
04-20650	7	8	04-21023-7	1	19
04-20665	17	14	04-21023-8	1	20
04-20666	17	20	04-21024-7	1	15
04-20673-3	2	2	04-21024-8	1	16
04-20674-7	2	1	04-21025	1	7
04-20674-8	2	6	04-21026	1	5
04-20675-7	2	12	04-21030-2	10	4
04-20675-8	2	14	04-21031-2	10	12
04-20732	20	9	04-21031-4	4	63
04-20749-3	23	5	04-21031-5	5	11
04-20765	65	2	04-21039	4	60
04-20781	20	47	04-21043	11	4
04-20787	18	11	04-21045	4	61
04-20791	18	20	04-21046	4	62
04-20838	11	27	04-21058	6	21
04-20847	21	5	04-21067	53	11
04-20852-3	67	32	04-21072	4	32
04-20863	10	3	04-21074	4	23
04-20864	10	11	04-21075	4	24
04-20866	11	2	04-21076	4	21
04-20867	11	30	04-21077-7	1	10
04-20880	5	14	04-21077-8	1	11



PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
04-21078-7	1	12	04-21359	22	21
04-21078-8	1	13	04-21360	4	70
04-21081	4	19	04-21369	48	1
04-21086	8	16	04-21377	16	3
04-21087	8	23	04-21382	1	27
04-21088	8	12	04-21387	11	46
04-21089	8	4	04-21391	4	3
04-21100	66	1	04-21402	7	4
04-21127	8	18	04-21420	7	2
04-21153-1	11	10	04-21422	7	6
04-21153-4	4	35	04-21429	31	8
04-21153-5	11	16	04-21434	18	10
04-21153-14	11	36	04-21435	18	13
04-21160	1	3	04-21437-2	10	23
04-21161	1	4	04-21437-4	10	18
04-21168-2	10	6	04-21438-3	4	74
04-21177	4	71	04-21439-4	13	14
04-21193	4	15	04-21439-5	11	20
04-21208-2	67	12	04-21439-8	11	51
04-21208-5	67	4	04-21439-11	11	21
04-21208-6	67	5	04-21439-12	13	17
04-21228	1	36	04-21439-14	13	15
04-21236	1	9	04-21439-15	13	16
04-21237	1	21	04-21439-16	14	3
04-21238	23	9	04-21439-17	13	10
04-21239	42	4	04-21441	3	10
04-21240	1	22	04-21442	3	8
04-21242	6	20	04-21445	18	5
04-21251	17	2	04-21450	12	20
04-21252	17	1	04-21458	32	1
04-21253	17	7	04-21463	65	90
04-21265	4	73	04-21465	4	13
04-21268	8	1	04-21466	4	10
04-21270	4	49	04-21469	2	4
04-21271	4	48	04-21470	2	3
04-21276-2	4	28	04-21475-2	1	31
04-21292	15	8	04-21477	18	14
04-21311	4	43	04-21478	18	17
04-21318-1	20	2	04-21479	18	9
04-21318-2	4	41	04-21481	18	1
	12	13	04-21485	13	6
04-21322	4	45	04-21489	34	22
04-21336	4	7	04-21503	67	35
04-21337	4	8	04-21510-1	34	18
04-21347	18	28	04-21510-2	34	20
04-21350	4	1	04-21510-5	32	4
04-21352	11	19	04-21513-1	34	3
04-21357	16	10	04-21530	67	21
04-21358	22	12	04-21534	4	75

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
04-21538	67	1	0800-0317-37	24	16
04-21547-2	67	27	0800-2042	24	46
04-21551-2	67	15	0800-3017-20	24	14
04-21562-2	34	2	0800-3017-39	24	23
04-21563	34	12	080061BE	10	20
04-21567	42	10	0821-6001-01	24	3
04-21569	5	5	0850-0114-54	24	13
04-21592	4	14	0850-0114-55	24	8
04-21597	31	2	0850-2005	25	6
04-21598	10	14	0850-2006	24	47
04-21599	10	40	085127-12	19	3
04-21626	7	17	0860-2006	25	7
04-21627	4	72	0870-2064-01	26	6
04-21628	10	1	090130SWC8	BULK	4
04-21632	10	5	0C-H7B	14	1
04-21633	10	10	10008-600	4	47
04-21635	4	66	1011-347-0605	65	50
04-21638	4	69	1011-348-0805	65	52
04-21639	4	65	1060-16-0622	65	40
04-21657	4	67		65	95
04-21672	4	68	1062-12-0166	20	34
04-21674	20	28	1062-20-0122	65	25
04-21676	67	33	116563-01	27	21
04-21701	6	17	1231/72	20	27
04-21703	20	43	12485651-125	65	49
04-21722	39	9	125HB-3-4	67	22
04-21742	32	12	125HBL-4-2	10	15
04-21748-2	4	53	129HB-6-4	34	16
04-21764	32	14	130119-01	27	32
04-21766	4	55	14375T9	65	92
04-21823	31	6	187080F-03-1	2	22
04-21824	31	4	202232A	9	2
04-21832-1	10	39	20593C400	65	57
04-21842	4	29	207ACBHS-4	34	14
0460-202-16141	24	49	213P-8	10	41
0460-215-16141	65	94	218N1T02	65	87
0462-201-16141	24	33	218N1T14	65	86
0462-201-1631	65	101	22190-220002	32	13
0508-0139	24	11	222N2T02	66	3
0509-0266-02	24	45	222N2T14	66	10
0515-0298-01	25	1	22310-200	3	5
0515-0299-02	25	9	22320-200	3	3
0518-0122	25	13	22330-200	3	4
0526-0259	24	6	228N3T02	2	10
0526-0399-62	24	15	228N3T14	2	18
0526-2060	25	5	231-0329	24	4
0528-001-5005	65	27	2-320564-3	18	23
0528-002-6005	65	100		20	48
070520BE	10	19	232-3698	24	7

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
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234N3T14	66	5		65	15
240-2128-ND	20	54		BULK	31
245M-ONAN-01	13	7	3271-6-133	16	14
25-1942-45-00-00	67	30		16	19
256512-00185-473812-000000	32	11		18	30
28988-4	27	11		18	43
	29	8		18	47
28A0807-0A2	18	50		18	49
29552-3	23	11		BULK	32
29552-4	23	4	3271-8-133	66	6
2ER654	18	38		BULK	33
	19	11	3493-1466	27	1
	20	20	354-310102-00-5869	17	5
	22	18	357-0091	26	1
	65	32	357-0092	26	4
2HB188	65	48	360HA001NF2520A	65	11
2KP504	65	54	39101-76030	3	9
30-10-0003	BULK	14		4	4
301-1C-S-D2-B120-7031	3	2		8	2
31S-276-0U	3	6		10	2
32004-A2	66	18		11	3
32004-B2	66	12		15	5
32004-TP2	66	16		17	9
32006-A22	65	79		21	2
32006-B22	65	72		32	8
32006-C22	65	77		34	23
32006-D22	65	80	3918196S	8	7
32006-TP2	65	68	40-10-0005	BULK	15
3271-12-65	4	37	40-10-0017	67	24
	11	12		BULK	16
	11	17	40CNFHS	4	58
	11	37	4219-0097	BULK	10
	BULK	28	4219-0102	BULK	17
3271-14-41	20	37	4230-0134	BULK	18
	65	67	4230-0147	BULK	12
	BULK	29	425-100-004	31	1
3271-16-26	18	24	4700-4	28	4
	19	7	5 WETX-B	11	50
	20	42	50-40-0018	67	17
	20	45	50-60-0028	67	29
	20	50	50-60-0045	67	19
	20	52	508-0139	BULK	37
	22	9	50CNTEAZ	17	15
	22	15	51864-5	18	26
	22	22	526-2050	26	5
	65	26	52937-1	65	85
	BULK	30	5-4 F6X-S	11	49

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
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55768-1	20	53	8100-0461	65	62
55936-2	22	13	8-325-82	4	34
55PP02872757640064	18	35	8-325-88	5	13
	20	39	832805-01	28	8
	22	14	834822-01	27	20
	65	20	850-2006	26	2
	66	7	865873-01	27	13
55PP02872757640064	BULK	21	88-20016	11	5
561-TA00600	18	53	88-20075	1	8
586-114112	2	21	88-20110	1	30
60-30-0012	BULK	42	88-20218	4	27
60-30-0025	67	34	88-20275-1	65	29
6189-0443	65	61		65	30
69-570-2	4	26	88-20275-2	65	75
6HB683	65	24	88-20275-3	19	6
6M14F82EDMXS	38	13		20	40
	39	7	88-20275-4	20	44
702807-01	27	28	88-20444-2	BULK	43
707509-01	28	6	88-20541-1	1	42
707807-02	28	9		BULK	26
71514-01	27	6	88-20564-14	17	13
7160-9465	65	60	88-20568-3	17	12
7165-0395	65	63		18	12
716511-02	28	5	88-21007-36	27	17
718514-01	27	10	88-21147	4	44
718515-01	27	30	88-21649-17	29	6
718516-01	27	33	88-21649-19	29	10
718517-01	27	31	88-21776	1	33
720-1119	24	5	88-22205	27	27
720982-0A	27	7	88-22336-1	17	17
72-2236	17	19	88-22487	BULK	6
747-55	BULK	27	88-22802	BULK	7
752826-0A	27	24	8HA889	22	23
777056-0A	28	10	8X	9	1
777116-0A	27	16	90278A331	4	17
778718-0A	27	15		5	16
7-826-000092	65	97	91355K54	67	6
791150-0A	28	13	9176K155	1	34
7HA302	22	20	92461A500	23	7
8002-002/MDL. NO. 34	2	8		65	118
800-2040	26	3	929939-1	65	55
800-3017-41	24	9	95395A250	11	8
801004-07	27	9		17	16
801048-04	27	12	963040-3	65	56

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PART NUMBER	FIG.	ITEM
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END OF WORK PACKAGE



**CHAPTER 7**

**SUPPORTING INFORMATION**

**FOR**

**AMMPS 30KW GENERATOR SET**

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CHAPTER 7  
SUPPORTING INFORMATION

WORK PACKAGE INDEX

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**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**REFERENCES**

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**SCOPE**

This WP lists all the field manuals, forms, technical manuals, and miscellaneous publications referenced in this TM.

**FIELD MANUALS**

FM 4-25.11	First Aid
FM 5-424	Theater of Operations Electrical Systems

**FORMS**

AFI 21-101	Aircraft and Equipment Maintenance Management
AFI 33-201	Air Force Instruction, Communications Security
AFR 900-4	Product Quality Deficiency Report (PQDR)
Air Force Technical Order (AFTO) Form 22	Technical Manual (TM) Change Recommendation and Reply
AR 25-30	The Army Publishing Program
AR 700-138	Army Logistics Readiness and Sustainability
CTA 8-10	Army Medical Department Expendable/Durable Items
CTA 50-909	Field and Garrison Furnishings and Equipment
CTA 50-970	Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items)
DA Form 2028	Recommended Changes to Publications and Blank Forms
DA Form 2258	Depreservation Guide for Vehicles and Equipment
DA Form 2404	Equipment Inspection and Maintenance Worksheet
DA Form 5988E	Equipment Inspection and Maintenance Worksheet (electronic version)
DA PAM 738-751	Functional Users Manual for The Army Maintenance Management System – Aviation (TAMMS-A)
DA PAM 750-8	TAMMS Users Manual
MCO P4855.10	Product Quality Deficiency Report (PQDR)
SF 361	Transportation Discrepancy Report
SF 368	Product Quality Deficiency Report

**TECHNICAL MANUALS**

NMWR 9-6115-752	National Maintenance Work Requirement (NMWR) for Generator Set, Skid Mounted 30 kW Advanced Medium Mobile Power Sources (AMMPS)
TM 1-1500-344-23	Aircraft Weapon Systems Cleaning and Corrosion Control
TM 4700-15/1	Tactical Equipment Records Procedures
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command)
TM 9-6115-752-10	Operator's Manual For Generator Set, Skid Mounted 30 kW Advanced Medium Mobile Power Sources (AMMPS)
TM 9-6115-752-13&P	Operator and Field Maintenance Manual Including Repair Parts and Special Tools List for Generator Set, Trailer Mounted 30 kW Advanced Medium Mobile Power Sources (AMMPS)
TO 00-20	Series of Technical Orders

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**MISCELLANEOUS DOCUMENTS**

A-A-52557A	Fuel Oil, Diesel; for Posts, Camps and Stations
A-A-52624A	Commercial Item Description: Antifreeze, Multi-engine Type
MIL-A-53009A	Military Specification, Additive, Antifreeze Extender, Liquid Cooling Systems
MIL-C-0010597F(ME)	Military Specification, Cleaning Compound with Conditioner for Engine Cooling Systems
MIL-DLT-83133G	Turbine Fuel, Aviation, Kerosene Type, JP-8 (NATO F-34), NATO F-35, and JP-8+100 (NATO F-37)
MIL-L-46152E	Military Specification, Lubricating Oil, Internal Combustion Engine, Administrative Service
MIL-PRF-2104H	Performance Specification, Lubrication Oil, Internal Combustion Engine, Combat/Tactical Service
MIL-PRF-21260E	Performance Specification, Lubrication Oil, Internal Combustion Engine, Preservative Break-In
MIL-PRF-22191F	Performance Specification, Barrier Materials, Transparent, Flexible, Heat-Sealable
MIL-PRF-46167D	Performance Specification, Lubrication Oil, Internal Combustion Engine, Arctic
MIL-STD-129	Military Marking Practices for Shipment and Storage
SAE-AMS-T-22085	Tapes, Pressure-Sensitive, Adhesive, Preservation and Sealing
TB-43-0211	Army Oil Analysis Program (AOAP) Guide for Leaders and Users
TB-750-651	Use of Antifreeze Solutions, Antifreeze Extender, Cleaning Compounds, and Test Kit in Engine Cooling Systems

**END OF WORK PACKAGE**

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**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION**

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## INTRODUCTION

### The Army Maintenance System MAC

This introduction provides a general explanation of all maintenance and repair functions authorized at the two maintenance levels under the Two-Level Maintenance System concept.

This MAC (immediately following the introduction) designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component shall be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

Field – includes two subcolumns, Crew (C) and Maintainer (F).

Sustainment – includes two subcolumns, Below Depot (H) and Depot (D).

The maintenance to be performed at field and sustainment levels is described as follows:

1. Crew maintenance. The responsibility of a using organization to perform maintenance on its assigned equipment. It normally consists of inspecting, servicing, lubricating, adjusting, and replacing parts, minor assemblies, and subassemblies. The replace function for this level of maintenance is indicated by the letter "C" in the third position of the SMR code. A "C" appearing in the fourth position of the SMR code indicates complete repair is possible at the crew maintenance level.
2. Maintainer maintenance. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "F" appearing in the third position of the SMR code. An "F" appearing in the fourth position of the SMR code indicates complete repair is possible at the field maintenance level. Items are returned to use after maintenance is performed at this level.
3. Below depot sustainment. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "H" appearing in the third position of the SMR code. An "H" appearing in the fourth position of the SMR code indicates complete repair is possible at the below depot sustainment maintenance level. Items are returned to the supply system after maintenance is performed at this level.
4. Depot sustainment. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "D" or "K" appearing in the third position of the SMR code. Depot sustainment maintenance can be performed by either depot personnel or contractor personnel. A "D" or "K" appearing in the fourth position of the SMR code indicates complete repair is possible at the depot sustainment maintenance level. Items are returned to the supply systems after maintenance is performed at this level.

The tools and test equipment requirements table (immediately following the MAC) list the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC.

The remarks table (immediately following the tools and test equipment requirements) contain supplemental instructions and explanatory notes for a particular maintenance function.

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## Maintenance Functions

Maintenance functions are limited to and defined as follows:

1. **Inspect.** To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel). This includes scheduled inspection and gaugings and evaluation of cannon tubes.
2. **Test.** To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards on a scheduled basis, i.e., load testing of lift devices and hydrostatic testing of pressure hoses.
3. **Service.** Operations required periodically to keep an item in proper operating condition, e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases. This includes scheduled exercising and purging of recoil mechanisms. The following are examples of service functions:
  - a. **Unpack.** To remove from the packing box for service or when required for the performance of maintenance operations.
  - b. **Repack.** To return item to the packing box after service and other maintenance operations.
  - c. **Clean.** To rid the item of contamination.
  - d. **Touch up.** To spot paint scratched or blistered surfaces.
  - e. **Mark.** To restore obliterated identification.
4. **Adjust.** To maintain or regulate, within prescribed limits, by bringing into proper position or by setting the operating characteristics to specified parameters.
5. **Align.** To adjust specified variable elements of an item to bring about optimum or desired performance.
6. **Calibrate.** To determine and cause corrections to be made or to be adjusted on instruments of test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.
7. **Remove/Install.** To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.
8. **Paint (ammunition only).** To prepare and spray color coats of paint so that the ammunition can be identified and protected. The color indicating primary use is applied, preferably, to the entire exterior surface as the background color of the item. Other markings are to be repainted as original so as to retain proper ammunition identification.
9. **Replace.** To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC, and the assigned maintenance level is shown as the third position code of the Source, Maintenance, and Recoverability (SMR) code.
10. **Repair.** The application of maintenance services, including fault location/troubleshooting, removal/installation, disassembly/assembly procedures, and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

## NOTE

The following definitions are applicable to the “repair” maintenance function:

Services. Inspect, test, service, adjust, align, calibrate, and/or replace.

Fault location/troubleshooting. The process of investigating and detecting the cause of equipment malfunction; the act of isolating a fault within a system or Unit Under Test (UUT).

Disassembly/assembly. The step-by-step breakdown (taking apart) of a spare/functional group coded item to the level of its least component that is assigned a SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).

Actions. Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

11. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like-new condition.
12. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like-new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

### Explanation of Columns in the MAC

Column (1) Group Number. Column (1) lists Functional Group Code (FGC) numbers, the purpose of which is to identify maintenance-significant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).

Column (2) Component/Assembly. Column (2) contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

Column (3) Maintenance Function. Column (3) lists the functions to be performed on the item listed in column (2). (For a detailed explanation of these functions, refer to “Maintenance Functions” outlined above.)

Column (4) Maintenance Level. Column (4) specifies each level of maintenance authorized to perform each function listed in column (3) by indicating work time required (expressed as man hours in whole hours or decimals) in the appropriate subcolumn. This work time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work time figures are to be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC. The symbol designations for the various maintenance levels are as follows:

#### Field:

- C Crew maintenance
- F Maintainer maintenance

#### Sustainment:

- L Specialized Repair Activity (SRA)
- H Below depot maintenance
- D Depot maintenance

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**NOTE**

The "L" maintenance level is not included in column (4) of the MAC. Functions to this level of maintenance are identified by work time figure in the "H" column of column (4), and an associated reference code is used in the REMARKS column (6). This code is keyed to the remarks, and the SRA complete repair application is explained there.

Column (5) Tools and Equipment Reference Code. Column (5) specifies, by code, those common tool sets (not individual tools), common Test, Measurement, and Diagnostic Equipment (TMDE), and special tools, special TMDE, and special support equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.

Column (6) Remarks Code. When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks table entries.

**Explanation of Columns in the Tools and Test Equipment Requirements**

Column (1) Tool or Test Equipment Reference Code. The tool or test equipment reference code correlates with a code used in column (5) of the MAC.

Column (2) Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

Column (3) Nomenclature. Name or identification of the tool or test equipment.

Column (4) National Stock Number (NSN). The NSN of the tool or test equipment.

Column (5) Tool Number. The manufacturer's part number.

**Explanation of Columns in the Remarks**

Column (1) Remarks Code. The code recorded in column (6) of the MAC.

Column (2) Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC.

**END OF WORK PACKAGE**

**FIELD AND SUSTAINMENT MAINTENANCE  
AMMPS 30KW GENERATOR SET  
MAINTENANCE ALLOCATION CHART (MAC)**

Table 1. MAC for AMMPS 30 kW Generator Set.

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level				(5) Tools & Equip Ref Code	(6) Remarks Code
			Field		Sustainment			
			Crew	Maintainer	Below Depot	Depot		
			C	F	H	D		
00	GENERATOR SET	0.6	0.5	0.3				A
		Repair		0.1			33	B
		Test		0.2			24	
01	DC ELECTRICAL INSTALLATION	Inspect	0.1	0.2				A
		Remove/Install		1.1			30	
		Repair		0.3			3, 6, 7, 20, 30	C
		Test		0.1			30	D
0101	RELAY PANEL ASSEMBLY	Inspect	0.1					A
		Remove/Install		0.2			30, 40	
		Repair		0.1			30	E
		Test		0.1			30	F
		Replace		0.2			30, 40	
02	HOUSING INSTALLATION	Inspect	0.1					A
		Remove/Install		3.4			30, 40	
		Repair		0.2			30, 33	G
03	DIGITAL CONTROL SYSTEM (DCS) INSTALLATION	Inspect	0.1	0.1				A
		Remove/Install		0.3			30	
		Repair		0.3	0.5		30	H
		Test		0.2			4, 30	
		Replace		0.2			30	
0301	CONTROL PANEL ASSEMBLY	Inspect	0.1	0.1				
		Remove/Install		0.4			22, 30	
		Repair		0.3	0.8		6, 7, 20, 22, 30	I
		Test		0.1			22, 30	J

Table 1. MAC for AMMPS 30 kW Generator Set — Continued.

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level				(5) Tools & Equip Ref Code	(6) Remarks Code
			Field		Sustainment			
			Crew	Maintainer	Below Depot	Depot		
			C	F	H	D		
0302	DCS ENCLOSURE ASSEMBLY	Replace		0.1			22, 30	
		Inspect		0.1				
		Remove/Install		0.4			22, 30	
		Repair			1.0		6, 7, 20, 22, 30	K
		Test			0.5		6, 7, 20, 22, 30	L
04	INTAKE AIR INSTALLATION	Replace		0.2			22, 30	
		Inspect	0.1	0.1				A,M
		Service		0.2				A,M
		Remove/Install		1.3			30	
		Repair		0.3			30	N
05	EXHAUST INSTALLATION	Replace		0.5			30	
		Inspect	0.1					A
		Remove/Install		0.9			30	
		Replace		0.4			30	
		Inspect	0.1	0.3				
06	COOLING SYSTEM INSTALLATION	Service		0.7			30	
		Remove/Install		5.0			30	
		Repair		0.4			30	O
		Test		0.2			23, 26, 28, 30	
		Replace		0.8			30	
07	FUEL SYSTEM INSTALLATION	Inspect	0.1					A
		Service	0.2	0.2			30, 38	A
		Remove/Install		2.3			11, 30, 31, 38, 39, 40	
0701	FUEL MANIFOLD ASSEMBLY	Repair		0.3			11, 30, 31, 38, 39, 40	P
		Inspect	0.1					A
		Remove/Install		2.0			9, 30 ,34, 35, 38, 39, 40	
		Repair		0.3			9, 30 ,34, 35, 38, 39, 40	
		Test		0.1			30	
		Replace		1.3			9, 30 ,34, 35, 38, 39, 40	



Table 1. MAC for AMMPS 30 kW Generator Set — Continued.

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level				(5) Tools & Equip Ref Code	(6) Remarks Code
			Field		Sustainment			
			Crew	Maintainer	Below Depot	Depot		
			C	F	H	D		
0702	FUELFILTER/WATER SEPARATOR INSTALLATION	Inspect	0.1					A
		Service	0.1	0.2			30, 36	A
		Remove/Install		0.4			30, 38, 40	
		Repair		0.2			30, 38, 40	Q
		Replace		0.3			30, 38, 40	
0703	FUEL COOLER INSTALLATION	Inspect						A
		Remove/Install		1.8			30, 40	
		Repair		0.1			30, 40	
		Replace		0.7			30, 40	
08	OUTPUT BOX INSTALLATION	Inspect	0.1	0.2				A
		Remove/Install		0.9			30	
		Repair		0.5			30, 33, 39, 40	
0801	CONTACTOR	Inspect		0.5				
		Remove/Install		3.7			30, 39, 40	
		Repair		0.5			6, 7, 20, 30, 39, 40	R
		Test		1.8			30	
0802	OUTPUT TERMINAL BOARD	Replace		0.1			30, 39, 40	
		Inspect	0.1					A
		Remove/Install		0.7			30, 38, 40	
0803	VOLTAGE SELECTION BOARD	Repair		0.2			30, 38, 40	
		Inspect	0.1	0.1				
		Remove/Install		0.8			30, 38, 39, 40	
0804	HOUR METER	Repair		0.2			30, 38, 39, 40	S
		Replace		0.5			30, 38, 39, 40	
		Inspect	0.1					A
		Remove/Install		0.5			30, 39, 40	
0805	CONVENIENCE RECEPTACLE	Repair		0.2			6, 7, 20, 30, 39, 40	T
		Test		0.1			30	
		Replace		0.3			30, 39, 40	
		Inspect	0.1					A
		Remove/Install		0.6			6, 7, 20, 19, 30, 39, 40	

Table 1. MAC for AMMPS 30 kW Generator Set — Continued.

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level				(5) Tools & Equip Ref Code	(6) Remarks Code
			Field		Sustainment			
			Crew	Maintainer	Below Depot	Depot		
			C	F	H	D		
0806	TRANSFORMERS	Repair		0.2			6, 7, 20, 19, 29, 30, 39, 40	U
		Test	0.1	0.1			30	
		Replace		0.3			6, 7, 20, 19, 30, 39, 40	
		Inspect		0.1				
		Remove/Install		0.7			30, 38, 40	
0807	PRINTED CIRCUIT BOARD MODULE	Repair		0.1			30, 33, 38, 40	V
		Test		0.1			30	
		Replace		0.2			30, 38, 40	
		Inspect		0.1				A
		Remove/Install		0.7			22, 30, 39, 40	
09	POWER PLANT INSTALLATION	Repair		0.1			322, 0, 39, 40	W
		Test		0.2			6, 7, 20, 22, 30	
		Replace		0.3			22, 30, 39, 40	
		Inspect	0.1	0.1				A
		Remove/Install		2.9			30, 37, 38, 40	
0901	AC GENERATOR ASSEMBLY	Repair		0.3			30, 37, 38, 40	X
		Replace		4.0			30, 37, 38, 40	
		Inspect	0.1	0.5				A
		Remove/Install		11.9			30, 37, 38	
		Repair		0.8	12.0		6, 7, 20, 30, 37, 38	Y
090101	ROTOR ASSEMBLY	Test		0.5			30	
		Replace		3.0			30, 37, 38	
		Inspect		0.3				
		Remove/Install		1.0			19, 30, 37, 40	
		Repair		0.5			6, 7, 19, 20, 30, 37, 40	Z
09010101	RECTIFIER ASSEMBLY	Test		1.0			30	
		Replace		1.0			19, 30, 37, 40	
		Inspect		0.3				
		Remove/Install		0.5			30, 40	
		Repair		0.4			30, 40	AA
		Test		0.2			30	
		Replace		0.5			30, 40	

Table 1. MAC for AMMPS 30 kW Generator Set — Continued.

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level				(5) Tools & Equip Ref Code	(6) Remarks Code	
			Field		Sustainment				
			Crew	Maintainer	Below Depot	Depot			
			C	F	H	D			
0902	ENGINE ASSEMBLY	Inspect	0.2	0.5	4.0		30, 37, 39	A	
		Service	0.1	0.3					
		Remove/Install		4.8					
		Repair		2.5					
		Test		1.5					
		Adjust		1.0	16.0	30, 37, 39			
		Replace		3.5					
		Overhaul							
090201	LUBRICATION SYSTEM	Inspect	0.1	0.1			30, 36	A	
		Service	0.1	1.5				A	
		Remove/Install		0.5				30	
		Repair		0.2				30	
		Replace		0.5				30	
090202	ENGINE OIL DRAIN HOSE ASSEMBLY	Inspect	0.1	0.1			30	A	
		Remove/Install		1.5				30	
		Repair		0.4				30	
		Replace		0.3				30	
090203	OIL COOLER	Inspect	0.1				30, 36	A	
		Remove/Install		1.1				30, 36	
		Repair		0.3				30, 36	
		Replace		0.6				30, 36	
090204	COALESCER	Inspect		0.1			30	BB	
		Service		0.2					30
		Remove/Install		1.2					30
		Repair		0.2					30
		Replace		0.5					30
090205	FUEL INJECTOR	Inspect		0.2			12, 15, 17, 30	A	
		Remove/Install		3.9					30
		Test		0.5					
		Replace		2.0					30
090206	TURBOCHARGER	Inspect	0.1	0.1			30	A	
		Remove/Install		3.7					30
		Repair		0.5					30
		Test		0.3					30

Table 1. MAC for AMMPS 30 kW Generator Set — Continued.

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level				(5) Tools & Equip Ref Code	(6) Remarks Code
			Field		Sustainment			
			Crew	Maintainer	Below Depot	Depot		
			C	F	H	D		
090207	HIGH PRESSURE FUEL PUMP	Replace		1.0			30	
		Inspect	0.1	0.1				A
		Remove/Install		3.6			18, 19, 30, 32	
		Repair		0.3			18, 19, 30, 32	CC
		Test		0.5			12, 30	
090208	FUEL RAIL AND FUEL LINES	Replace		1.0			18, 19, 30, 32	
		Inspect	0.1	0.2				A
		Remove/Install		5.0			30	
		Repair		0.2			30	DD
		Test		0.3			12, 30	
090209	SPIN-ON FUEL FILTER ASSEMBLY	Replace		0.5			30	
		Inspect	0.1	0.1				A
		Service		0.2			30, 36	A
		Remove/Install		1.3			30, 36	
		Repair		0.3			30	EE
090190	THERMOSTAT	Replace		0.5			30, 36	
		Inspect		0.7				
		Remove/Install		1.5			30	
		Repair		0.2			30	FF
		Test		0.5			28	
090191	WATER PUMP	Replace		0.5			30	
		Inspect	0.1	0.2				A
		Remove/Install		1.5			11, 30	
		Repair		0.1			11, 30	
090192	BATTER CHARGING ALTERNATOR AND BELT	Replace		0.5			11, 30	
		Inspect	0.1	0.1				A
		Service		0.2			30	
		Remove/Install		0.8			30	
090193	STARTER	Test		0.5			30	
		Replace					30	
		Inspect		0.1				A
		Remove/Install		0.5			30	

Table 1. MAC for AMMPS 30 kW Generator Set — Continued.

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level				(5) Tools & Equip Ref Code	(6) Remarks Code
			Field		Sustainment			
			Crew	Maintainer	Below Depot	Depot		
			C	F	H	D		
090191	INTAKE AIR HEATER	Test		0.2			30	
		Replace		0.5			30	
		Inspect		0.1				
		Remove/Install		0.9			30	
		Test		0.1			30	
090195	INTAKE MANIFOLD	Replace		0.2			30	A
		Inspect	0.1	0.1				
		Remove/Install		1.5			30	
		Replace		1.5			30	
		Inspect	0.1	0.1				
090196	EXHAUST MANIFOLD	Remove/Install		2.4			30	A
		Replace		1.0			30	
		Inspect	0.1	0.1				
		Remove/Install		0.5			30, 31	
		Replace		0.5			30, 31	
090197	OIL PAN AND STRAINER	Inspect	0.1	0.1				A
		Remove/Install		0.5			30, 31	
		Replace		0.5			30, 31	
		Inspect		0.1				
		Remove/Install		0.5			30, 40	
090198	BELT TENSIONER AND IDLER PULLEY	Replace		0.5			30, 40	A
		Inspect		0.1				
		Remove/Install		0.5			30, 40	
		Replace		0.5			30, 40	
		Inspect		0.1				
090199	ELECTRONIC CONTROL MODULE (ECM)	Remove/Install		1.1			30	A
		Test		0.3			30	
		Replace		0.4			30	
		Inspect	0.1	0.1				
		Remove/Install		0.8			30	
090220	ENGINE ECM WIRING HARNESS	Test		0.3			30	A
		Replace		0.4			30	
		Inspect	0.1	0.1				
		Remove/Install		0.8			30	
		Test		0.3			30	
090219	ENGINE ECM SENSORS	Replace		0.5			30	GG
		Inspect	0.1	0.1				
		Remove/Install		1.5			30	
		Repair		0.1			30	
		Test		0.2			30	
		Replace		1.5			30	

Table 1. MAC for AMMPS 30 kW Generator Set — Continued.

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level				(5) Tools & Equip Ref Code	(6) Remarks Code
			Field		Sustainment			
			Crew	Maintainer	Below Depot	Depot		
			C	F	H	D		
090222	CYLINDER HEAD ASSEMBLY	Inspect		0.2				A
		Remove/Install		5.5			30	
		Repair		0.5	5.0		30	HH
		Test		1.3	1.0		1, 27, 30	
		Replace		1.5			30	
09022201	VALVE COVER	Inspect	0.1	0.1				A
		Remove/Install		2.4			30	
		Repair		0.2			30	II
		Replace		0.8			30	
09022202	ROCKER ARMS AND PUSH RODS	Inspect			.1			
		Remove/Install			2.0		30	
		Repair			2.0		30	
		Test			0.2		30	
		Adjust		5.0	0.5		30	
		Replace			2.0		30	
090223	SHORT BLOCK ASSEMBLY	Inspect			0.5			A
		Remove/Install			7.0		30	
		Repair		0.7	15.0		30	JJ
		Replace			8.0		30	
09022301	CONNECTING RODS	Inspect			0.2			
		Remove/Install			9.0		30	
		Repair			10.0		30	KK
		Test			0.5		30	
		Replace			9.0		30	
09022302	PISTONS	Inspect			0.2			
		Remove/Install			9.0		30	
		Repair			10.0		30	LL
		Test			0.5		30	
		Replace			9.0		30	
09021903	CRANKSHAFT AND CRANKSHAFT GEAR	Inspect			0.2			
		Remove/Install			9.5		30	
		Repair			10.0		30	MM
		Replace			9.5		30	

Table 1. MAC for AMMPS 30 kW Generator Set — Continued.

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level				(5) Tools & Equip Ref Code	(6) Remarks Code
			Field		Sustainment			
			Crew	Maintainer	Below Depot	Depot		
			C	F	H	D		
09022304	FRONT GEAR CASE COVER	Test			0.5		30	A
		Inspect		0.1				
		Remove/Install		2.0			19, 30	
		Repair		0.5			30	
09022305	FRONT CRANKSHAFT OIL SEAL	Replace		2.0			19, 30	A
		Inspect		0.1				
		Replace		0.5			13, 30	
		Inspect		.1				
09022306	CRANKSHAFT PULLEY	Remove/Install		0.5			19, 30	
		Replace		0.5			19, 30	
		Inspect						
		Inspect						
09022307	CAMSHAFT AND GEAR	Inspect			0.2			
		Remove/Install			3.0		30	
		Repair			1.0		30	
		Test			0.5		30	
09022308	OIL PUMP	Adjust			0.5		30	
		Replace			3.0		30	
		Inspect			0.1			
		Remove/Install			2.0		30	
09022309	FLYWHEEL AND FLYWHEEL HOUSING	Test			0.5		25, 30	
		Replace			2.0		30	
		Inspect		0.2				
		Remove/Install		12.0			13, 30, 37	
10	ENGINE (MAIN) WIRING HARNESS INSTALLATION	Repair		1.0			13, 30, 37	NN
		Test		0.8			14, 30	
		Replace		2.0			13, 30, 37	
		Inspect	0.1	0.1				
		Remove/Install		4.6			30	OO
		Repair		0.5			6, 7, 20, 30	
		Test		0.2			30	
		Replace		2.0			30	

Table 1. MAC for AMMPS 30 kW Generator Set — Continued.

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level				(5) Tools & Equip Ref Code	(6) Remarks Code
			Field		Sustainment			
			Crew	Maintainer	Below Depot	Depot		
			C	F	H	D		
11	POWER WIRING HARNESS INSTALLATION	Inspect		0.1			30	A
		Remove/Install		2.5			6, 7, 20, 30	
		Repair		0.5			30	PP
		Test		0.2			30	
		Replace		2.1			30	
12	WINTERIZATION KIT INSTALLATION	Inspect	0.1	0.1				A
		Remove/Install		1.0			29, 30, 40	
		Repair		0.5			29, 30, 40	
		Test		0.3			2, 30	
		Replace		1.0			29, 30, 40	

Table 2. Tools and Test Equipment for AMMPS 30 kW Generator Set.

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NSN	TOOL NUMBER
1	F	Adapter, Compression Tester		3164728
2		Bank, Load	G76852	
3	F	Beaker, Laboratory	6640009575578	1080-500
4	O,F	Cable, Auxiliary With NATO Plug	6520011993317	4202042
5	F	Cable, Local Control		04-21226
6	F	Cable, Remote Control		04-21227
7	F	Crimping, Tool, Terminal		KTC S0159
8	F	Crimping, Tool, Terminal, Hand	5120013748936	J-38852
9	F	Crowfoot Attachment Set, Socket Wrench, Flare Nut, Metric		KTC S0170



Table 2. Tools and Test Equipment for AMMPS 30 kW Generator Set — Continued.

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NSN	TOOL NUMBER
10	F	Crowfoot Attachment Set, Socket Wrench, Flare Nut, Standard		KTC S0161
11	F	Forward Repair System	4940015331619	SC 4940-95-E42
12	F	Hammer, Hand, Soft Face, Dead Blow		KTC S0219
13	F	Hose, Fuel Return Flow		3164617
14	F	Installer, Crankshaft Seal		3164900
15	F	Kit, Crack Detection	6635013292190	3375432
16	F	Nozzle, Fuel Injection, Nonaircraft	2910015612837	3164325
17	F	Oiler, Hand		50-573
18	F	Plug, Tube Fitting, Threaded	4730015591178	3164583
19	F	Puller Attachment, Mechanical	5120011282674	3375326
20	F	Puller Set, Mechanical		KTC S0269
21	F	Remover, Electrical Contact	5120011584707	111010
22	F	Screwdriver, Torx, T20, 3" Long		KTC S0372
23	F	Strap, Wrist, Electrostatic Discharge	5920011913509	4720
24	F	Test Kit, Radiator Pressure		KTC S0698
25	F	Test Set, Electronic Systems	6625011938968	13580880
26	F	Test Set, Oil Systems Pressure		3289
27	F	Tester, Antifreeze Solution		KTC S0699
28	F	Tester, Cylinder Compression	4910015624370	MT33C

Table 2. Tools and Test Equipment for AMMPS 30 kW Generator Set — Continued.

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NSN	TOOL NUMBER
29	F	Thermometer, Self-Indicating	6685002421984	ASTM 10F
30	F	Tool Kit, Blind, Fastener, Installation		KTC S0700
31	F	Tool Kit, General Mechanic's (GMTK)	5180015487637	SC 5180-95-B48
32	F	Tool Set, SATS, Base	4910011906303	SC 4910-95-A81
33	F	Tool, Fuel Pump Retention		4818677
34	F	Tool, Rivet Nut		01METRIC
35	F	Torque Tube, 5-75 FT-LB		64-154
36	F	Torque Wrench Head End, 1/4" X 3/8" Drive, 5/8"		64-309
37	F	Wrench, Oil Filter, Strap		KTC S0982
38	F	Wrench, Torque, Click, Ratcheting, 1/2" Drive, 250 FT-LB		KTC S0991
39	F	Wrench, Torque, Click, Ratcheting, 3/8" Drive, 75 FT-LB		KTC S0989
40	F	Wrench, Torque, Dial, 1/4" Drive, 30 IN-LB		KTC S0986
41	F	Wrench, Torque, Dial, 3/8" Drive, 300 IN-LB		KTC S0987

Table 3. Remarks for the AMMPS 30kW Generator Set.

REMARKS CODE	REMARKS
A	Preventive Maintenance Checks and Services (PMCS)
B	Generator Set repair includes replacement of identification plates, lifting eyes, clinch nuts, and repair of Control Harness.
C	DC Electric Installation repair includes the replacement of batteries, battery cables, NATO slave receptacle, Electromagnetic Relay Switch, DC circuit breaker, and Dead Crank switch.

**Table 3. Remarks for the AMMPS 30kW Generator Set — Continued.**

REMARKS CODE	REMARKS
D	DC Electric Installation test includes testing of batteries, DC circuit breaker, and Dead Crank switch.
E	Relay Panel Assembly repair includes replacement of circuit breakers and relays.
F	Relay Panel Assembly test includes testing of circuit breakers and relays.
G	Housing Installation repair includes the replacement of access doors, panels, door latches, hinges, brackets, access covers, clinch nuts, and repair of electrical leads.
H	DCS Installation repair includes replacement of the control box assembly, control box gasket, DCS enclosure assembly, and DCS control panel assembly.
I	DCS Control Panel Assembly repair includes replacement of cable assemblies, switches, control panel, membrane assembly, gaskets, LCD display, panel heater, and circuit card assemblies.
J	DCS Control Panel Assembly test includes testing of switches and circuit card assemblies.
K	DCS Enclosure Assembly repair includes replacement of cable assemblies, gaskets, and circuit card assemblies.
L	DCS Enclosure Assembly test includes testing of circuit card assemblies.
M	Intake Air and Installation Inspect and service functions include the inspection and servicing of the service indicator, hose assemblies, and filter element.
N	Intake Air and Installation Repair function includes the repair and replacement of the service indicator, hose assemblies, charge air cooler and filter element.
O	Cooling System Installation repair includes the replacement of the radiator assembly, coolant tank assembly, and cooling fans.
P	Fuel System Installation repair function includes the repair and replacement of the tank assembly, electrical leads, and fuel system module.
Q	Fuel Filter/Water Separator Installation repair function includes the replacement of the water sensor.
R	Contactor repair includes the replacement and repair of electrical leads.
S	Voltage Selection Board repair includes the replacement and repair of electrical leads and harnesses.
T	Hour Meter repair includes the replacement and repair of the wiring harness.
U	Convenience Receptacle Assembly repair includes replacement and repair of the cable assemblies.
V	Transformers repair includes replacement of clinch nuts.
W	Printed Circuit Board Module repair includes the replacement and repair of electrical leads and wiring harnesses.
X	Power Plant Installation repair includes the replacement of the engine assembly and AC generator assembly.
Y	AC Generator Assembly repair includes the replacement of the endbell assembly, stator assembly, and rotor assembly.
Z	Rotor Assembly repair function includes the replacement of the exciter rotor assembly and varistor assembly.

**Table 3. Remarks for the AMMPS 30kW Generator Set — Continued.**

REMARKS CODE	REMARKS
AA	Rectifier Assembly repair function includes the replacement of the forward and reverse rectifier assemblies.
BB	Coalescer repair function includes the repair of hose assemblies, and the replacement of clinch nuts and filter element.
CC	High Pressure Fuel Pump repair function includes the replacement of a gear and o-ring.
DD	Fuel Rail repair function includes the replacement of fuel tubes.
EE	Spin-On Fuel Filter Assembly repair function includes the replacement of the filter element and fuel filter head.
FF	Thermostat repair function includes the replacement of the thermostat gasket.
GG	ECM Sensors repair function includes the replacement of O-rings.
HH	Cylinder Head repair includes the replacement of head gasket and valve components.
II	Valve Cover repair includes the replacement and repair of the valve cover assembly.
JJ	Short Block Assembly repair includes the replacement of threaded and expansion plugs.
KK	Connecting Rods repair includes the replacement and repair of the connecting rod assembly.
LL	Pistons repair includes the replacement and repair of the piston assembly.
MM	Crankshaft repair includes the replacement and repair of the crankshaft and bearing assemblies.
NN	Flywheel and Flywheel Housing Repair includes the replacement of the rear oil seal.
OO	Engine Wiring Harness repair includes the replacement and repair of connector assemblies.
PP	Power Wiring Harness repair includes the replacement and repair of connector assemblies.

**END OF WORK PACKAGE**

**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**EXPENDABLE AND DURABLE ITEMS LIST**

## INTRODUCTION

### Scope

This work package lists expendable and durable items that you will need to operate and maintain the AMMPS 30 kW generator set. This list is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except Medical Class V Repair Parts, and Heraldic Items), CTA 50-909, Field and Garrison Furnishings and Equipment, or CTA 8-100, Army Medical Department Expendable/Durable Items.

### Explanation of Columns in the Expendable/Durable Items List

Column (1) Item No. This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the item (e.g., Use brake fluid (WP 0098, Item 5)).

Column (2) Level. This column identifies the lowest level of maintenance that requires the listed item (C=Crew, F=Field/ASB, H=Below Depot).

Column (3) National Stock Number (NSN). This is the NSN assigned to the item which you can use to requisition it.

Column (4) Item Name, Description, Part Number/(CAGEC). This column provides the other information you need to identify the item. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC) (in parentheses).

Column (5) U/I. Unit of Issue (U/I) code shows the physical measure or count of an item, such as gallon, dozen, gross, etc.

**Table 1. Expendable and Durable Items.**

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, PART NUMBER/(CAGEC)	(5) U/I
1	F	6810-00-201-0906	Alcohol, denatured, 16 oz, 837015 (19203)	BT
2	C	6850-00-664-1403	Antifreeze, ethylene glycol, 1 gal, A-A-52624 (58536)	GL
3	F	8145-01-440-3417	Bag, barrier, 11509521 (18876)	EA
4	H	8950-01-407-9105	Baking soda, 01900 (90038)	EA
5	F	7920-00-514-2417	Brush, acid swabbing, 803-12 (7S147)	GR
6	F	5120-01-371-9268	Brush, battery terminal, BTC3A (55719)	EA
7	C	7920-01-127-4376	Brush, wire, scratch, brass wire, 71966 (76169)	EA
8	C	5340-00-450-5718	Cap set, protective, dust and moisture seal, 10935405 (19207)	EA
9	C	6850-01-534-8820	Cleaning compound, electrical contact, 02130 (10136)	CN
10	H	6850-01-053-2540	Cleaning compound, engine cooling system, MACS SUPER FAST FLUSH 1500 (72527)	BT
11	F	6850-01-474-2317	Cleaning compound, solvent, BT05 (0K209)	CO
12	C	5350-00-221-0872	Cloth, abrasive, crocus, ANSI B74.18 (80204)	PG

Table 1. Expendable and Durable Items — Continued.

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, PART NUMBER/(CAGEC)	(5) U/I
13	C	7920-01-482-6042	Cloth, cleaning, electronics, 792000NIB0395, (1A920)	BX
14	F	8030-00-105-0270	Compound, antiseize, 1 lb can with brush top, NSBT-16N (5W425)	CN
15	F	8030-01-396-3362	Compound, sealing, 50 mL bottle, 68035 (05972)	BT
16	C	8030-01-508-9181	Compound, sealing, 5699 (05972)	TU
17	C	6640-01-515-8388	Cotton swab, special, 362 (5L934)	PG
18	F	7930-00-068-1669	Detergent, general purpose P-D-1747 (81348)	BX
19	C	6810-00-107-1510	Distilled water, ACS, O-C-265 (81348)	DR
20	C	9140-00-286-5286	Fuel, diesel, DF-1, AA52557-1 (58536)	GL
21	C	9140-00-286-5294	Fuel, diesel, DF-2, AA52557-2 (58536)	GL
22	C	9150-01-179-1589	Grease, electrically conductive, BEMS 15030 (59364)	CA
23	C	9150-00-929-7946	Grease, general purpose, G-60/EPV (76736)	CA
24	F	6850-01-160-3868	Inhibitor, corrosion, liquid cooling system, MIL-A-53009 (81349)	QT
25	C	9150-01-518-9477	Lubricating oil, engine, 1 qt MIL-PRF-2104H OE/HDO-15/40, MIL-PRF-2104 (81349)	QT
26	C	9150-00-189-6727	Lubricating oil, engine, 1 qt MIL-PRF-2104H OE/HDO-10, 10W/QT/CN/2104 (13873)	QT
27	C	9150-00-402-2372	Lubricating oil, engine, arctic 5 gal -65°F (-54°C), MIL-PRF-46167 (81349)	CN
28	H	9150-00-111-3199	Lubricating oil, engine, preservation 5 gallon, MIL-PRF-21260 (81349)	CN
29	H	7920-01-430-5028	Pad, scouring, 048011-04028 gray 6" X 9" (27293)	EA
30	H	4910-01-490-6453	Pan, drain, KTC S0255 (00NS2)	EA
31	H	9150-00-261-7899	Penetrating oil, VV-P-216 (81348)	PT
32	H	8030-00-082-2508	Primer, sealing compound, 74755 (05972)	BT
33	C	7920-00-205-3571	Rag, wiping, DDD-R-0030 (81348)	BX
34	F	8030-01-465-1390	Sealant, 56507 (05972)	EA
35	C	8520-01-133-8099	Soap, ivory, 7385T11 (39428)	EA
36	H	5975-00-074-2072	Strap, tie-down, electrical components, PLT2SC (06383)	HD
37	C	9905-00-537-8954	Tag, marker, 50 each bundle, 9905-00-537-8954 (64067)	BD
38	C	7510-00-117-5520	Tape, pressure sensitive, black conforming to SAE-AMS-T-22085, 481 (52152)	RO
39	C	8135-01-054-0738	Wire, tie, TIEWIRE16GA3-1/2LB (56319)	CL

END OF WORK PACKAGE

**FIELD AND SUSTAINMENT MAINTENANCE**  
**AMMPS 30KW GENERATOR SET**  
**MAINTENANCE AND DEFERRED MAINTENANCE ITEMS LIST**

**GENERAL INFORMATION**

This WP lists all maintenance items, as well as deferred maintenance items, displayed by the DCS and their corresponding maintenance prompt and interval. The interval displayed on the DCS refers to operating hours remaining until the corresponding maintenance prompt is due for maintenance. The interval in Table 1 represents the total time interval in operating hours for a maintenance item. When a maintenance prompt is deferred, a deferred maintenance item code appears within the operating hours interval given in Table 2. Maintenance items provide operator feedback in conjunction with fault and warning codes (WP 0006, Warning and Fault Codes).

**Table 1. Maintenance Item Codes and Prompts.**

<b>CODE</b>	<b>INTERVAL (HRS OR CALENDAR)</b>	<b>MAINTENANCE PROMPT</b>
5001	50.0	[First change engine oil and filter]
5002	750.0 or 6 months	[Change engine oil and filter]
5003	750.0 or 6 months	[Change fuel filter/water separator]
5004	750.0 or 6 months	[Replace air filter]
5005	2000.0 or 2 years	[Drain coolant and flush system]
5006	750.0 or 6 months	[Inspect Aux Fuel Filter]
5007	2000.0 or 2 years	[Engine Valve check/adjust]
5009	500.0 or 6 months	[Inspect radiator cap for damage]
5010	1500.0	[Replace drive belts]
5011	24.0	[Perform Daily Preventative Maintenance]
5012	5000.0 or 4 years	[Replace Coalescer Filter Element]
5013	3000.0	[Inspect and Replace Auto Belt Tensioner]
5014	1 year	[Inspect and Test Winterization Kit]
5016	250 or 3 months	[Test and Reset GFI Receptacle]
5017	250 or 3 months	[Clean Radiator, Breather, Chrg Air/Fuel Coolers]

Table 2. Deferred Maintenance Item Codes and Prompts.

CODE	INTERVAL (HRS)	MAINTENANCE PROMPT
6001	24.0	[First change engine oil and filter]
6002	72.0	[Change engine oil and filter]
6003	72.0	[Change fuel filter/water separator]
6004	72.0	[Replace air filter]
6005	72.0	[Drain coolant and flush system]
6006	72.0	[Inspect Aux Fuel Filter]
6007	72.0	[Engine Valve check/adjust]
6009	48.0	[Inspect radiator cap for damage]
6010	72.0	[Replace drive belts]
6011	12.0	[Perform Daily Preventative Maintenance]
6012	72.0	[Replace Coalescer Filter Element]
6013	72.0	[Inspect and Replace Auto Belt Tensioner]
6014	72.0	[Inspect and Test Winterization Kit]
6016	24.0	[Test and Reset GFI Receptacle]
6017	24.0	[Clean Radiator, Breather, Chrg Air/Fuel Coolers]

END OF WORK PACKAGE



## GLOSSARY

### SCOPE

This WP defines all of the terms used in the AMMPS 30 kW generator set TM.

#### TERM

#### DEFINITION

24-VDC electrical system

A system used to create and maintain 24 VDC to power the generator set. The system includes two 12-V batteries, a battery-charging alternator rotated by an engine driven V-belt, and the required wiring and support components.

AC electrical system

This is the system that supplies Alternating Current from the generator set to the load. The power is generated by the AC generator and transferred to the load via the output box.

AC Circuit Interrupt Switch (AC CIRCUIT INTERRUPT)

This switch controls the operation of the AC contactor, which allows the generator set to be connected or disconnected to the load or switch box.

Automatic Voltage Regulator (AVR)

Electrical regulator designed to automatically maintain a constant voltage level. Important component in synchronous generators, it controls the output voltage of the generator by controlling its excitation.

Advanced Medium Mobile Power Sources (AMMPS)

Newest generation of battlefield electric power supply.

Battery-charging alternator

A small, engine-mounted power generator that creates 24 VDC when rotated by an engine-driven belt.

Battery-charging alternator belt  
Battleshort

The engine-driven belt that rotates the battery-charging alternator.

A condition in which some military equipment can be placed so it does not shut down when circumstances would be damaging to the equipment or personnel.

BATTLESHORT switch

This switch is placed in the ON position during situations when constant power is required without disruption; it allows the system to override Faults/Warnings that would normally shutdown the generator set. In normal operation, the Battleshort switch will be in the OFF position to protect the generator set.

#### CAUTION

A notation in the manual that informs the reader that possible damage to the machine may occur if conditions listed are not met.

Chemical Agent Resistant Coating (CARC)

The CARC paint is used on the housing assembly for the generator set to protect it from the environment.

Coalescer

A large crankcase ventilation filter located inside the right-side body panel.

Convenience receptacle

A plug-in 110-V electrical outlet mounted at the rear of the generator set similar to the one used in a typical American home.

Digital Control System (DCS)

The DCS, which is located at the rear of the gen set, is a microprocessor-based control that allows the operator and maintainer to start/stop the gen set, operate the contactor, adjust voltage and frequency, clear/reset generator faults, and perform other necessary functions to provide power. Contains three components: Control Box, Control Board Assembly, and Front Panel Assembly.

DCS screen

LCD with a menu-driven display format to control generator set operations.

Electrical Control Module (ECM)

An electronic control that manages engine functions by gathering data from numerous sensors located on the engine.

Engine control switch

This switch provides the local control for the generator set. The engine control switch has four positions: OFF, PRIME & RUN AUX FUEL, PRIME & RUN, and RUN.

Exhaust-side

The side of the engine where the exhaust manifold is mounted.

<b>TERM</b>	<b>DEFINITION</b>
External fuel system	The system that allows fuel to be pumped from a holding device not attached to the generator set into the generator set fuel tank.
Fault code	A message displayed on the DCS when a mechanical fault is detected. The code is displayed as a number followed by a short descriptive message.
Flywheel-end	The end of the engine where the flywheel is mounted.
Front	When used to describe a direction in relation to the generator set, the front is the end of the generator set opposite of the DCS.
Fuel pump, auxiliary	Fuel pump used to pump fuel from an external source to the internal fuel tank of the generator set.
Fuel pump, main	Fuel pump used to pump fuel from the internal fuel tank of the generator set to the engine.
Inspect	A method (usually visual) used to determine damage to a component.
Intake air heater	A 24-V electric heater mounted to the engine intake manifold used to heat incoming air to reduce start-up time in cold weather.
Intake air heater relay	The electrical switch that controls the operation of the intake air heater.
Intake-side	The side of the engine where the intake manifold is mounted.
Internal fuel system	The system housed within the generator set to fuel the engine. This includes the fuel tank, main fuel pump, fuel/water separator, and the required lines, fittings, and other components.
Left-side	The side of the machine that houses the intake air grille and a forward door. As the operator stands directly facing the DCS looking out, over the generator set, the side of the machine to his left is the left-side.
Mode I	Mode I refers to the output of the generator set expressed in cycles per seconds (Hz). Mode I is a 50/60 Hz machine.
Mode II	Mode II refers to the output of the generator set expressed in cycles per seconds (Hz). Mode II is a 400 Hz machine.
NOTE	A notation in the manual that informs the reader helpful information that will assist in the completion of a maintenance task.
Ohm	The Ohm is a unit of electrical resistance. One V will cause a current of 1 Amp to flow through a resistance of 1 $\Omega$ .
Phase	Phase refers to the windings of an AC generator.
Power Plant (PP)	This is two AMMPS generator sets hooked up in parallel with the use of a switch box.
Power Unit (PU)	This is a single AMMPS generator set.
Rear	The end of the machine where the DCS is mounted.
Remove	A maintenance task to remove a component from the generator set.
Repair	A maintenance task to restore a component to operational condition, usually by disassembly, parts replacement, and re-assembly of the component.
Replace	A maintenance task to remove a component from the generator set with no intent to re-install the same component. The original component is to be disposed of and replaced with new component.
Right-side	The side of the machine that houses the output box and a forward door. As the operator stands directly facing the DCS looking out, over the generator set, the side of the machine to his right is the right-side.
Service	A maintenance task performed, usually on a scheduled basis, to restore or replenish items consumed during normal operation.

TERM	DEFINITION
Soft key buttons	The soft button keys are located below the display panel on the DCS. The function of each button varies with the soft key function on the display panel.
Test	A maintenance task to determine if a component is performing correctly or to specification.
Volt [V]	The volt is a unit of electrical potential. A potential of 1 V will cause a current of 1 Amp to flow through a resistance of 1 $\Omega$ .
Water pump-end	The end of the engine where the water pump is mounted.
WARNING	A notation in the manual that informs the reader that possible personal injury or death may occur if conditions listed are not met.
Warning code	A message displayed on the DCS when a mechanical fault is detected that, if the cause is left untreated, will cause damage to the equipment. The code is displayed as a number followed by a short descriptive message.
Watt	A unit of electrical power. In DC circuits, wattage equals voltage multiplied by amperage. In AC circuits, wattage equals effective voltage multiplied by effective amperage multiplied by power factor multiplied by a constant dependent on the number of phases. 1,000 W are equal to 1 kW.
Winterization kit	The winterization kit, located on the inside of the right-side panel, is a fuel-fired coolant heater providing the ability to heat the coolant in extreme cold conditions.

**END OF WORK PACKAGE**



<b>RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS</b> For use of this form, see AR 25-30; the proponent agency is OAASA						Use Part II ( <i>reverse</i> ) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	<b>DATE</b> 06 01 09
<b>TO</b> ( <i>Forward to proponent of publication or form</i> ) ( <i>Include ZIP Code</i> ) Commander: US Army CECOM LCMC ATTN: AMSEL-LC-LEO-E-CM Fort Monmouth, NJ 07703-5006						<b>FROM</b> ( <i>Activity and location</i> ) ( <i>Include ZIP Code</i> ) Jane Q. Doe, SFC 1234 Any Street Anytown, AL 34565	
<b>PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS</b>							
<b>PUBLICATION/FORM NUMBER</b> TM 11-1234-567-14						<b>DATE</b> 06 01 09	<b>TITLE</b> Operator, Field and Sustainment Support Maintenance Manual for Radio, AN/ABC-123
<b>ITEM</b>	<b>PAGE</b>	<b>PARA-GRAPH</b>	<b>LINE</b>	<b>FIGURE NO.</b>	<b>TABLE</b>	<b>RECOMMENDED CHANGES AND REASON</b>	
1	WP 0005 PG 3		2			Test or Corrective Action column should identify a different WP number.	
<i>* Reference to line numbers within the paragraph or subparagraph.</i>							
<b>TYPED NAME, GRADE OR TITLE</b> Jane Q. Doe, SPC					<b>TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION</b> 123-4567		<b>SIGNATURE</b>

TO (Forward direct to addressee listed in publication)				FROM (Activity and location) (Include ZIP Code)				DATE	
PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS									
PUBLICATION NUMBER TB 9-2590-528-13&P				DATE			TITLE INTERROGATION ARM ASSEMBLY (IAA)		
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION	
PART III – REMARKS (Any general remarks, recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)									
TYPED NAME, GRADE OR TITLE Jane Q. Doe, SPC				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION 123-4567			SIGNATURE		

<b>RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS</b>  For use of this form, see AR 25-30; the proponent agency is OAASA						Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	<b>DATE</b>
<b>TO</b> (Forward to proponent of publication or form) (Include ZIP Code)						<b>FROM</b> (Activity and location) (Include ZIP Code)	
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<b>PUBLICATION/FORM NUMBER</b>						<b>DATE</b>	<b>TITLE</b>
<b>ITEM</b>	<b>PAGE</b>	<b>PARA- GRAPH</b>	<b>LINE</b>	<b>FIGURE NO.</b>	<b>TABLE</b>	<b>RECOMMENDED CHANGES AND REASON</b>	
<i>* Reference to line numbers within the paragraph or subparagraph.</i>							
<b>TYPED NAME, GRADE OR TITLE</b>				<b>TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION</b>		<b>SIGNATURE</b>	

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PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS								
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<b>ITEM</b>	<b>PAGE</b>	<b>PARA- GRAPH</b>	<b>LINE</b>	<b>FIGURE NO.</b>	<b>TABLE</b>	<b>RECOMMENDED CHANGES AND REASON</b>	
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TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION			SIGNATURE		

By Order of the Secretary of the Army:

**RAYMOND T. ODIERNO**  
*General, United States Army*  
*Chief of Staff*

Official:



**JOYCE E. MORROW**  
*Administrative Assistant to the*  
*Secretary of the Army*  
1127906

By Order of the Secretary of the Air Force:

**NORTON A. SCHWARTZ**  
*General, USAF*  
*Chief of Staff, USAF*

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**DONALD J. HOFFMAN**  
*General, USAF*  
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By Order of the Marine Corps:

**J. E. CAVE**  
*Product Group Director, PG-15*  
*Ground Transportation Engineer Systems*  
*Marine Corps System Command*

By Order of the Secretary of the Navy:

**NAVAL FACILITIES ENGINEERING  
COMMAND (NAVFAC)**

**NAVAL FACILITIES EXPEDITIONARY  
LOGISTICS CENTER (NFELC)  
CODE EXP 21**

Army Distribution: To be distributed IAW the Initial Distribution Number (IDN) 25786 requirements for TM 9-6115-752-24&P.

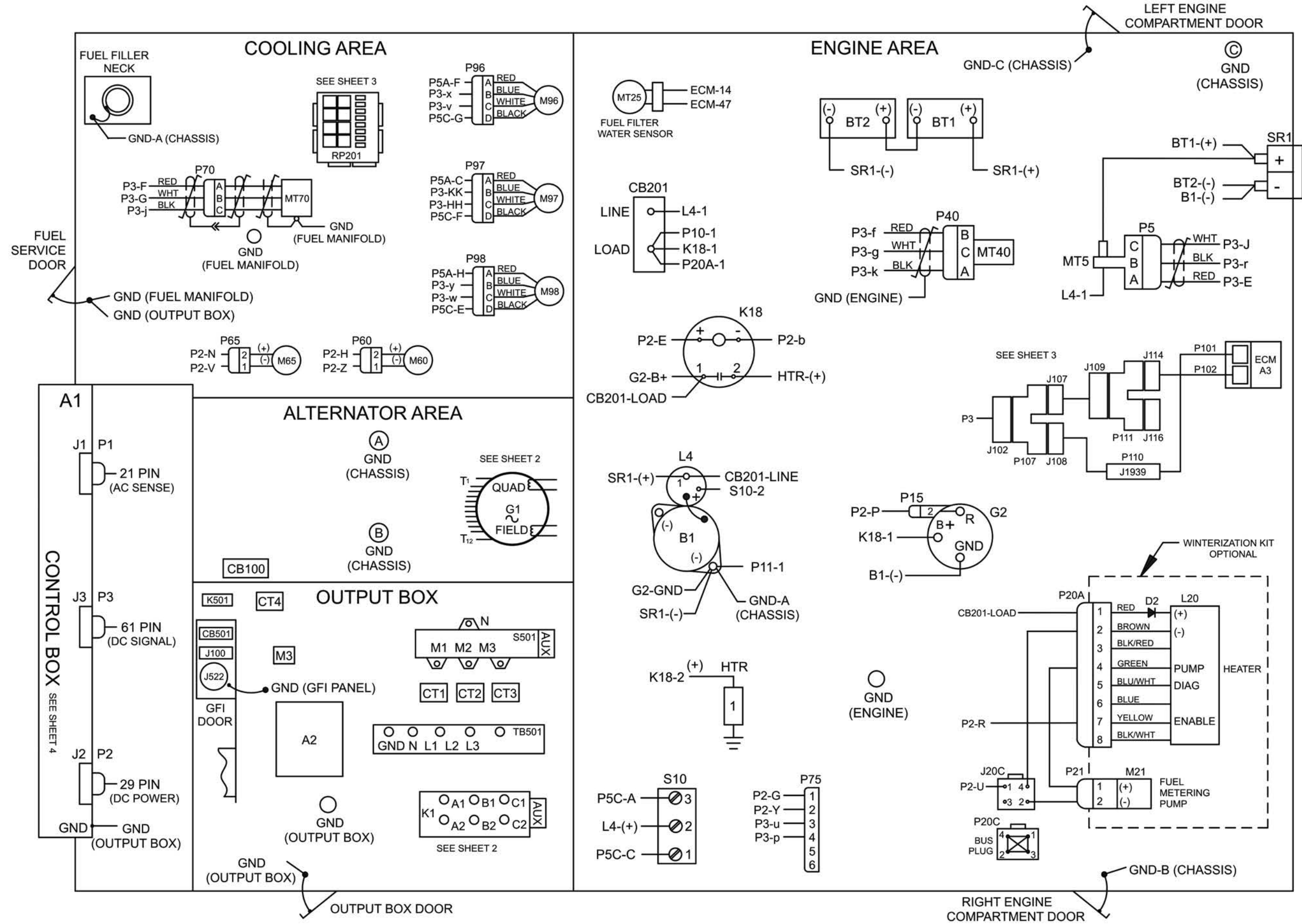
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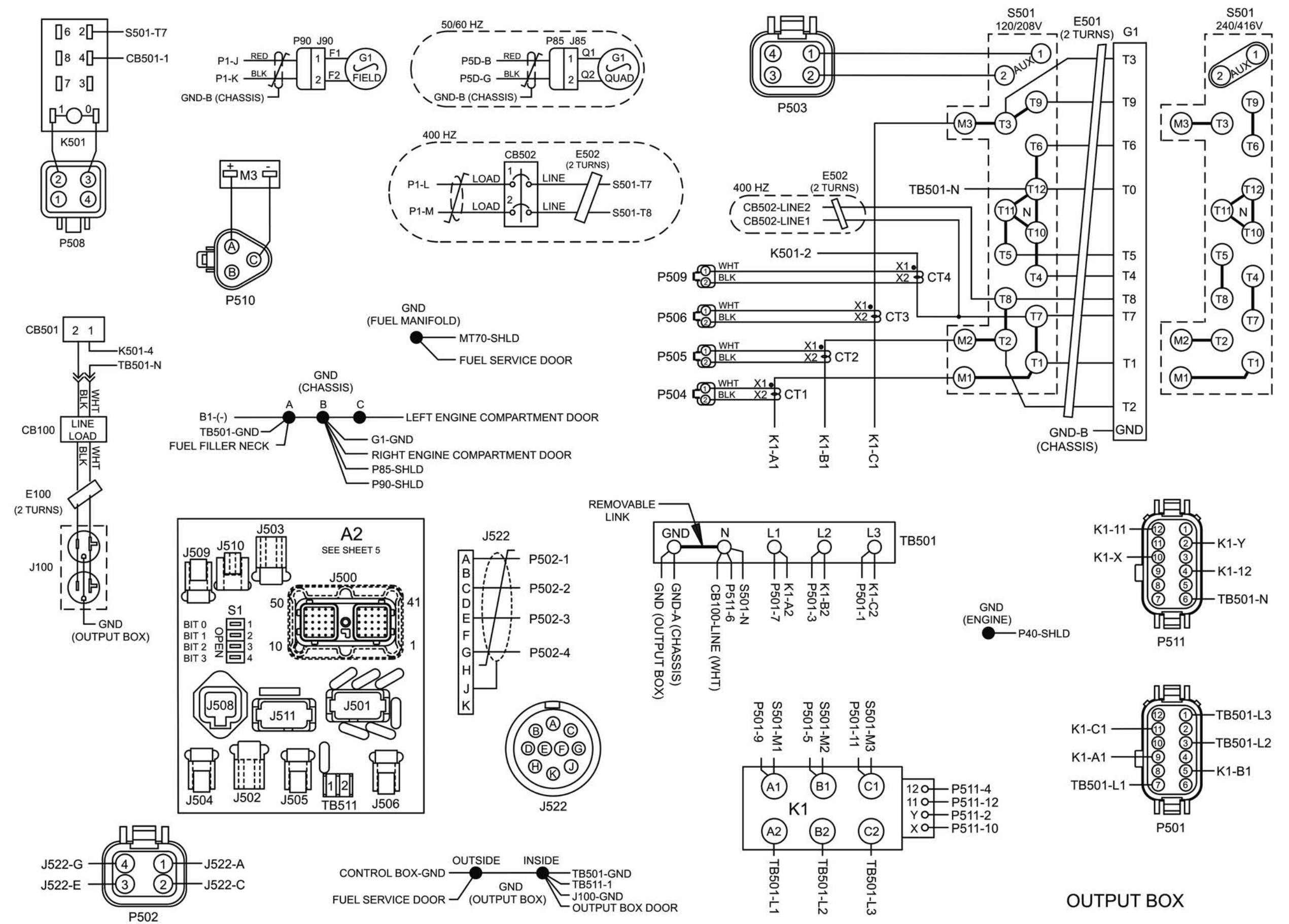




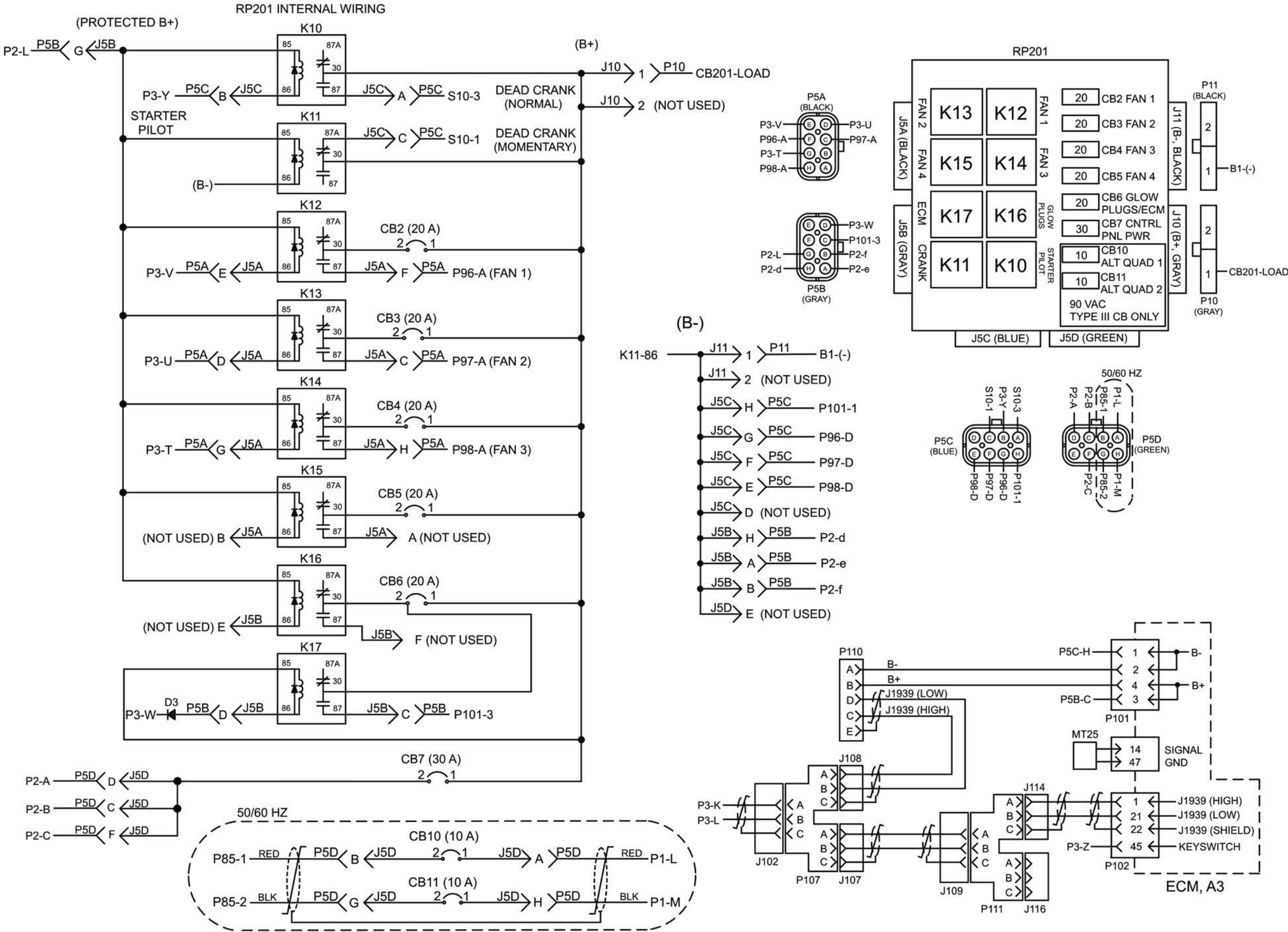


FO-1. Wiring Diagram (Sheet 1 of 6).  
FP-1/FP-2 blank

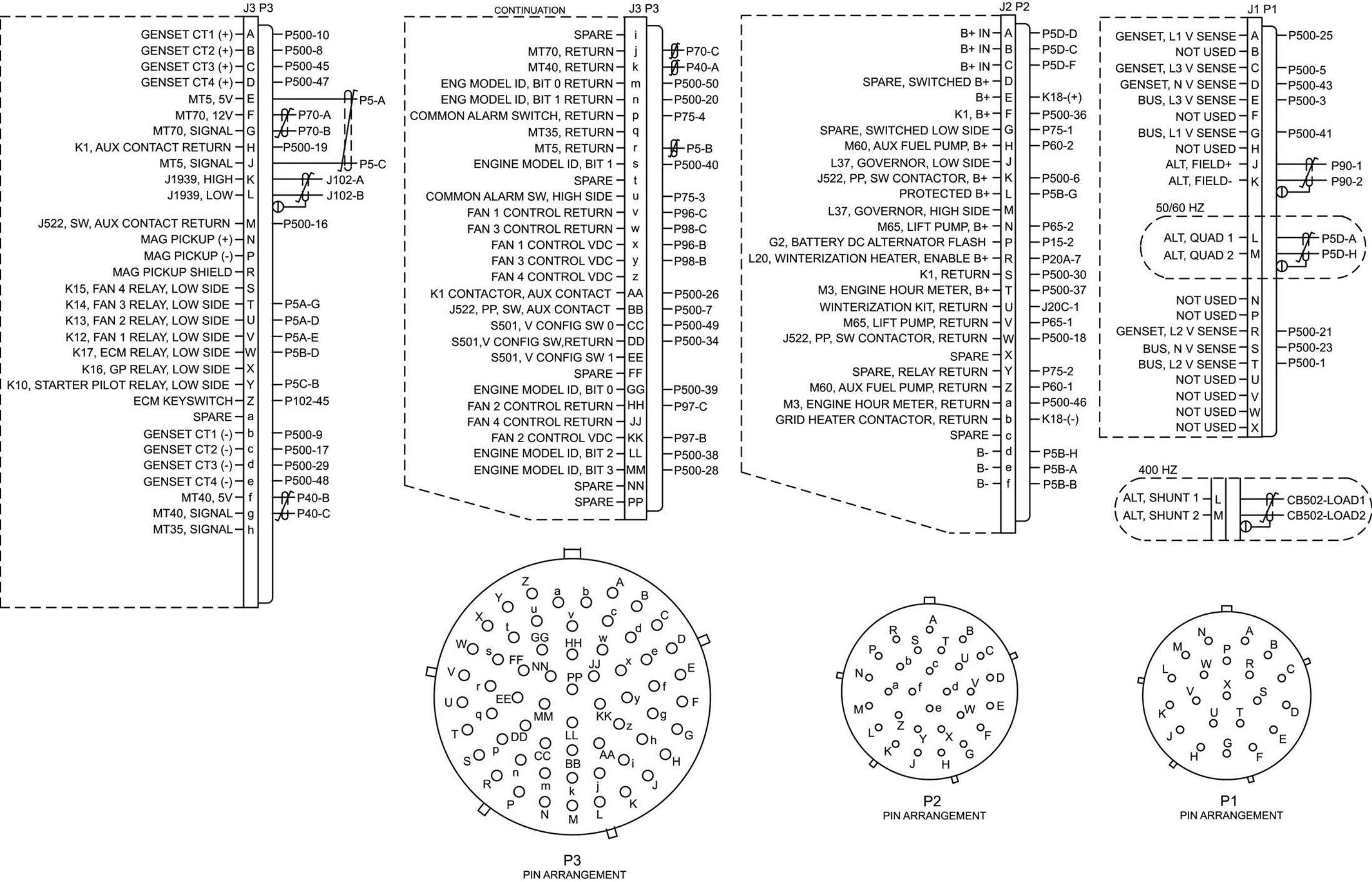






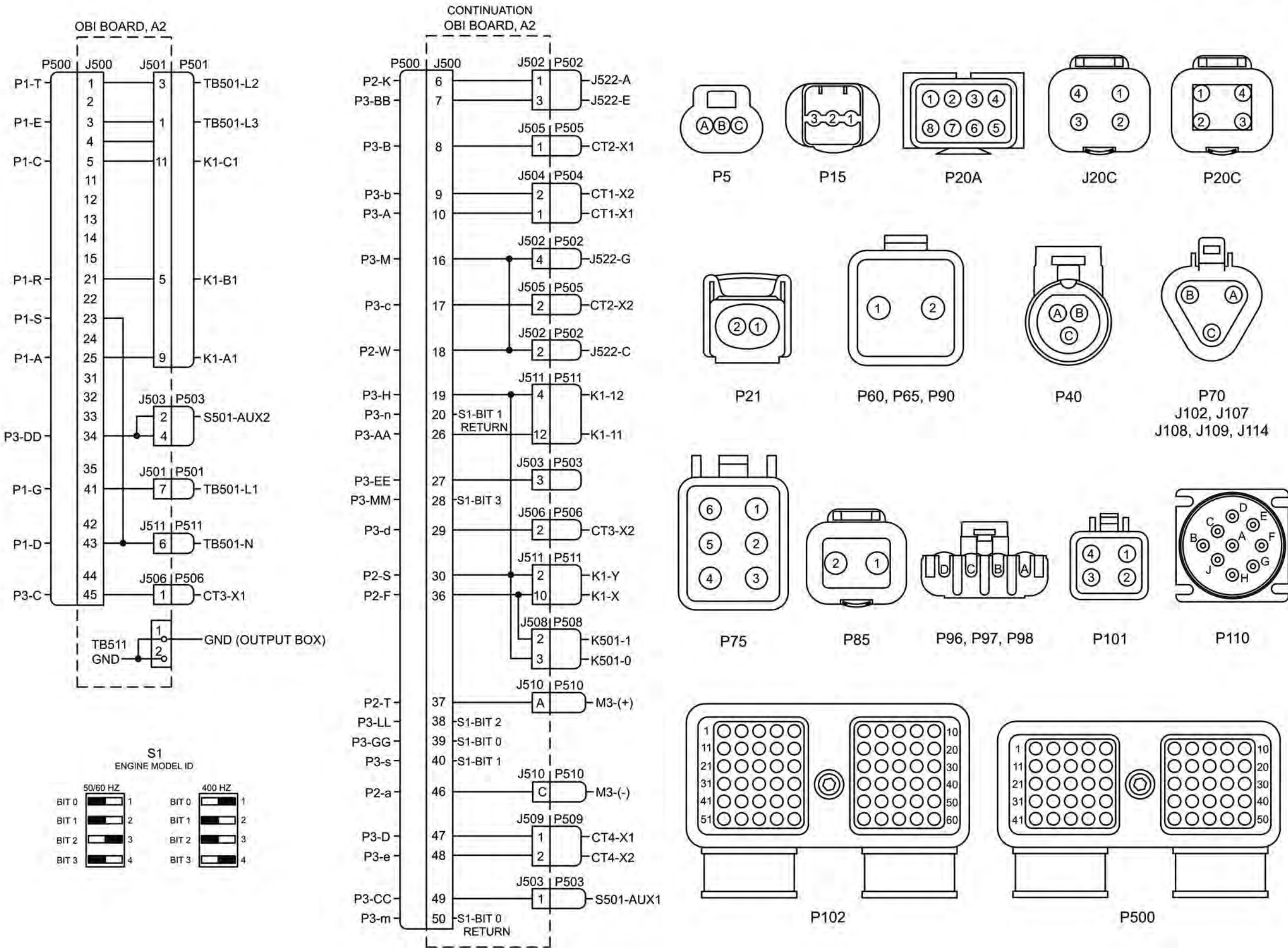










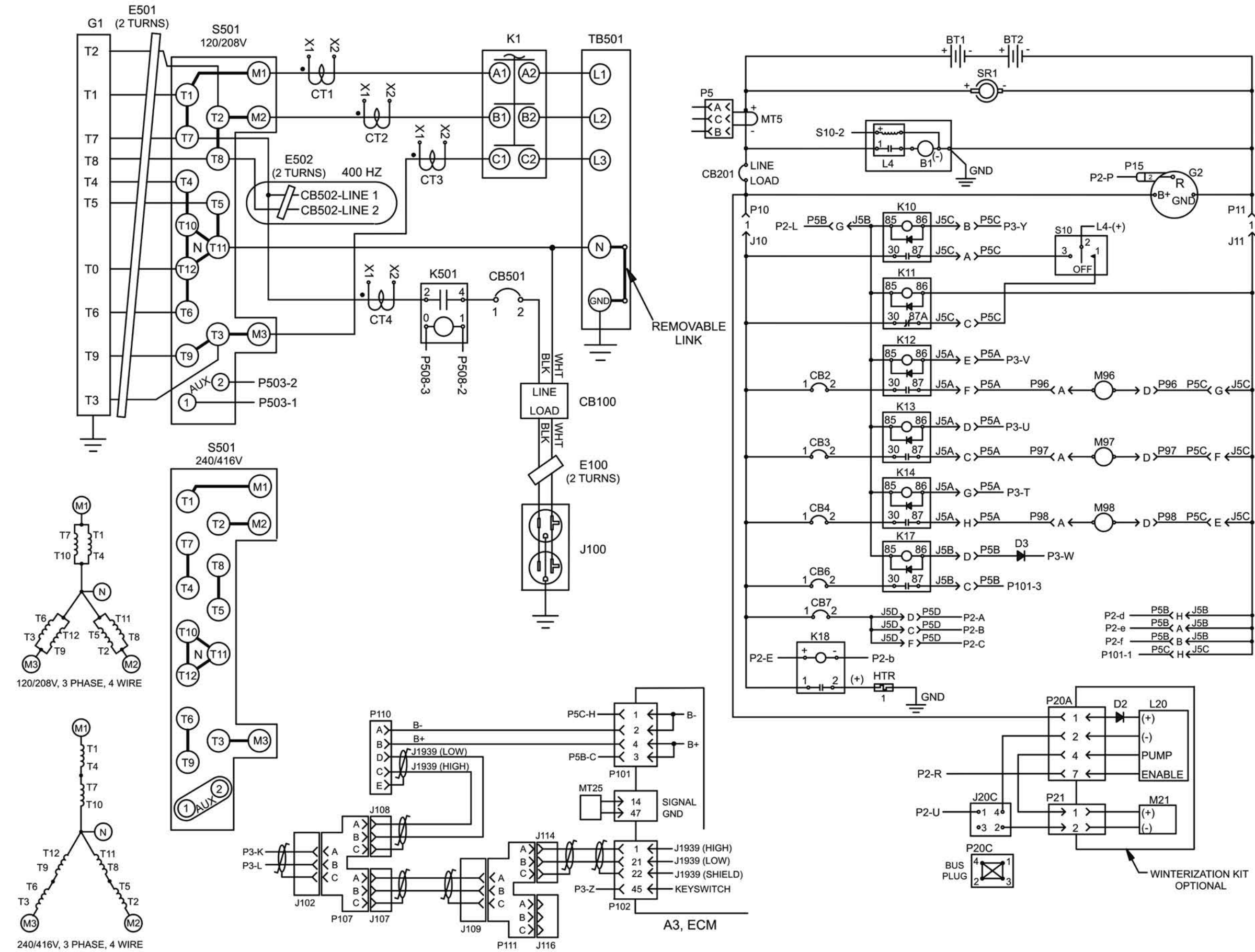




LEGEND

A1	GENSET CONTROLLER/DISPLAY	J108	RECEPTACLE J1939 DIAGNOSTIC	P5	PLUG BATTERY CURRENT SENSOR
A2	OUTPUT BOX INTERFACE BOARD	J109	RECEPTACLE J1939 ECM	P5A	PLUG (BLACK) RELAY PANEL
A3	ENGINE CONTROL MODULE	J114	RECEPTACLE J1939 ECM SIGNALS	P5B	PLUG (GRAY) RELAY PANEL
B1	STARTER MOTOR	J116	RECEPTACLE J1939 TERMINATING RESISTOR	P5C	PLUG (BLUE) RELAY PANEL
BT1	BATTERY 12V	J500	RECEPTACLE OBI	P5D	PLUG (GREEN) RELAY PANEL
BT2	BATTERY 12V	J501	RECEPTACLE CONTACTOR	P10	PLUG (GRAY) B+
CB2	CIRCUIT BREAKER COOLING FAN 1	J502	RECEPTACLE SW BOX CONTROL	P11	PLUG (BLACK) B-
CB3	CIRCUIT BREAKER COOLING FAN 2	J503	RECEPTACLE VOLTAGE SELECT SWITCH	P15	PLUG DC ALTERNATOR FLASH
CB4	CIRCUIT BREAKER COOLING FAN 3	J504	RECEPTACLE CT1	P20A	PLUG WINTERIZATION HEATER
CB5	CIRCUIT BREAKER (NOT USED)	J505	RECEPTACLE CT2	P20C	PLUG WINTERIZATION KIT BUS
CB6	CIRCUIT BREAKER ECM	J506	RECEPTACLE CT3	P21	PLUG FUEL METERING PUMP
CB7	CIRCUIT BREAKER CONTROL PNL	J508	RECEPTACLE AC RELAY	P40	PLUG OIL PRESSURE SENDER
CB10	CIRCUIT BREAKER ALTERNATOR QUAD	J509	RECEPTACLE CT4	P60	PLUG AUX FUEL PUMP
CB11	CIRCUIT BREAKER ALTERNATOR QUAD	J510	RECEPTACLE HOUR METER	P65	PLUG LIFT FUEL PUMP
CB100	INTERRUPTER GFCI	J511	RECEPTACLE CONTACTOR CONTROL	P70	PLUG FUEL LEVEL SENSOR
CB201	CIRCUIT BREAKER MAIN DC	J522	RECEPTACLE PP SW BOX CONTROL	P75	PLUG SPARES
CB501	CIRCUIT BREAKER RECEPTACLE AC	K1	AC MAIN CONTACTOR	P85	PLUG QUAD WINDING-50/60 HZ
CB502	CIRCUIT BREAKER SHUNT-400 HZ	K10	RELAY STARTER PILOT	P90	PLUG FIELD WINDING
CT1	CURRENT TRANSFORMER	K11	RELAY CRANK PILOT	P96	PLUG COOLING FAN 1
CT2	CURRENT TRANSFORMER	K12	RELAY COOLING FAN 1	P97	PLUG COOLING FAN 2
CT3	CURRENT TRANSFORMER	K13	RELAY COOLING FAN 2	P98	PLUG COOLING FAN 3
CT4	CURRENT TRANSFORMER	K14	RELAY COOLING FAN 3	P101	PLUG ECM POWER
D2	DIODE WINTERIZATION HEATER	K15	RELAY (NOT USED)	P102	PLUG ECM SIGNALS
D3	DIODE ECM	K16	RELAY (NOT USED)	P107	PLUG J1939 ECM/DIAGNOSTIC
E100	FERRITE EMI FILTER GFCI	K17	RELAY ECM	P110	PLUG J1939 DIAGNOSTIC
E501	FERRITE EMI FILTER AC GENERATOR	K18	RELAY HEATER	P111	PLUG J1939 ECM
E502	FERRITE EMI FILTER SHUNT-400 HZ	K501	RELAY AC RECEPTACLE	P500	PLUG OBI
F1/2	FIELD WINDING	L1	OUTPUT TERMINAL	P501	PLUG CONTACTOR
G1	AC GENERATOR	L2	OUTPUT TERMINAL	P502	PLUG SW BOX CONTROL
G2	BATTERY CHARGING ALTERNATOR	L3	OUTPUT TERMINAL	P503	PLUG VOLTAGE SELECT SWITCH
GND	GROUND	L4	STARTER SOLENOID	P504	PLUG CT1
HTR	ENGINE HEATER	L20	WINTERIZATION HEATER	P505	PLUG CT2
J1	RECEPTACLE CONTROL BOX AC SENSE	M3	HOUR METER	P506	PLUG CT3
J2	RECEPTACLE CONTROL BOX DC POWER	M21	FUEL METERING PUMP	P508	PLUG AC RELAY
J3	RECEPTACLE CONTROL BOX DC SIGNAL	M60	FUEL PUMP AUXILIARY	P509	PLUG CT4
J5A	RECEPTACLE (BLACK) RELAY PANEL	M65	FUEL PUMP LIFT	P510	PLUG HOUR METER
J5B	RECEPTACLE (GRAY) RELAY PANEL	M96	COOLING FAN 1	P511	PLUG CONTACTOR CONTROL
J5C	RECEPTACLE (BLUE) RELAY PANEL	M97	COOLING FAN 2	Q1/2	QUAD WINDING
J5D	RECEPTACLE (GREEN) RELAY PANEL	M98	COOLING FAN 3	RP201	RELAY PANEL
J10	RECEPTACLE (GRAY) B+	MT5	BATTERY CURRENT SENSOR	S1	SWITCH ENGINE ID
J11	RECEPTACLE (BLACK) B-	MT25	FUEL FILTER WATER SENSOR	S10	DEAD CRANK SWITCH
J20C	RECEPTACLE WINTERIZATION KIT BUS	MT40	OIL PRESSURE SENDER	S501	VOLTAGE RECONNECTION BOARD
J85	RECEPTACLE QUAD WINDING-50/60 HZ	MT70	FUEL LEVEL SENSOR	SR1	NATO SLAVE RECEPTACLE
J90	RECEPTACLE FIELD WINDING	N	NEUTRAL	TB501	OUTPUT LOAD TERMINAL BOARD
J100	CONVENIENCE RECEPTACLE	P1	PLUG CONTROL BOX AC SENSE	TB511	OBI BOARD GROUND
J102	RECEPTACLE J1939 SIGNALS	P2	PLUG CONTROL BOX DC POWER		
J107	RECEPTACLE J1939 ECM	P3	PLUG CONTROL BOX DC SIGNAL		

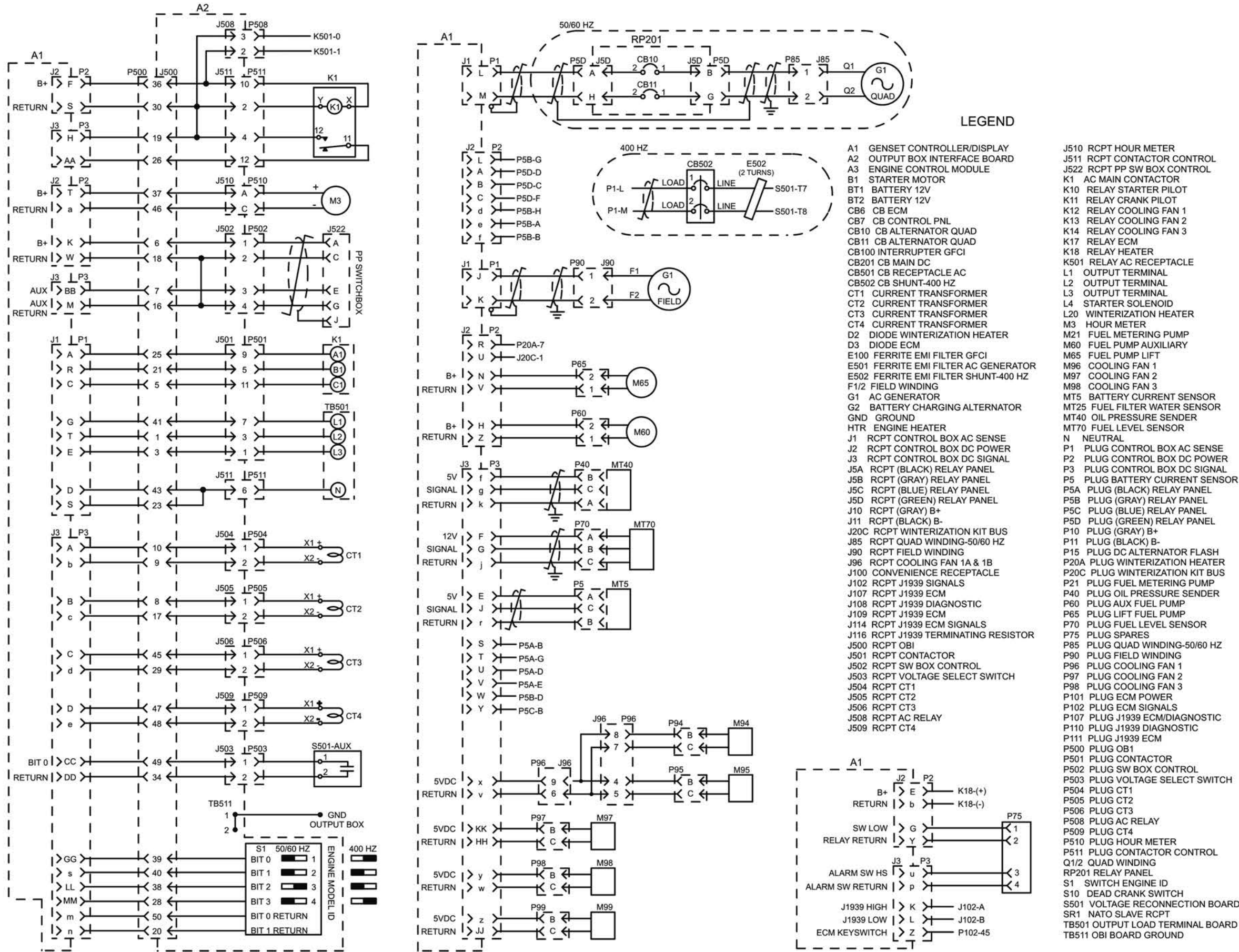




FO-2. Schematic Diagram (Sheet 1 of 2).  
FP-13/FP-14 blank





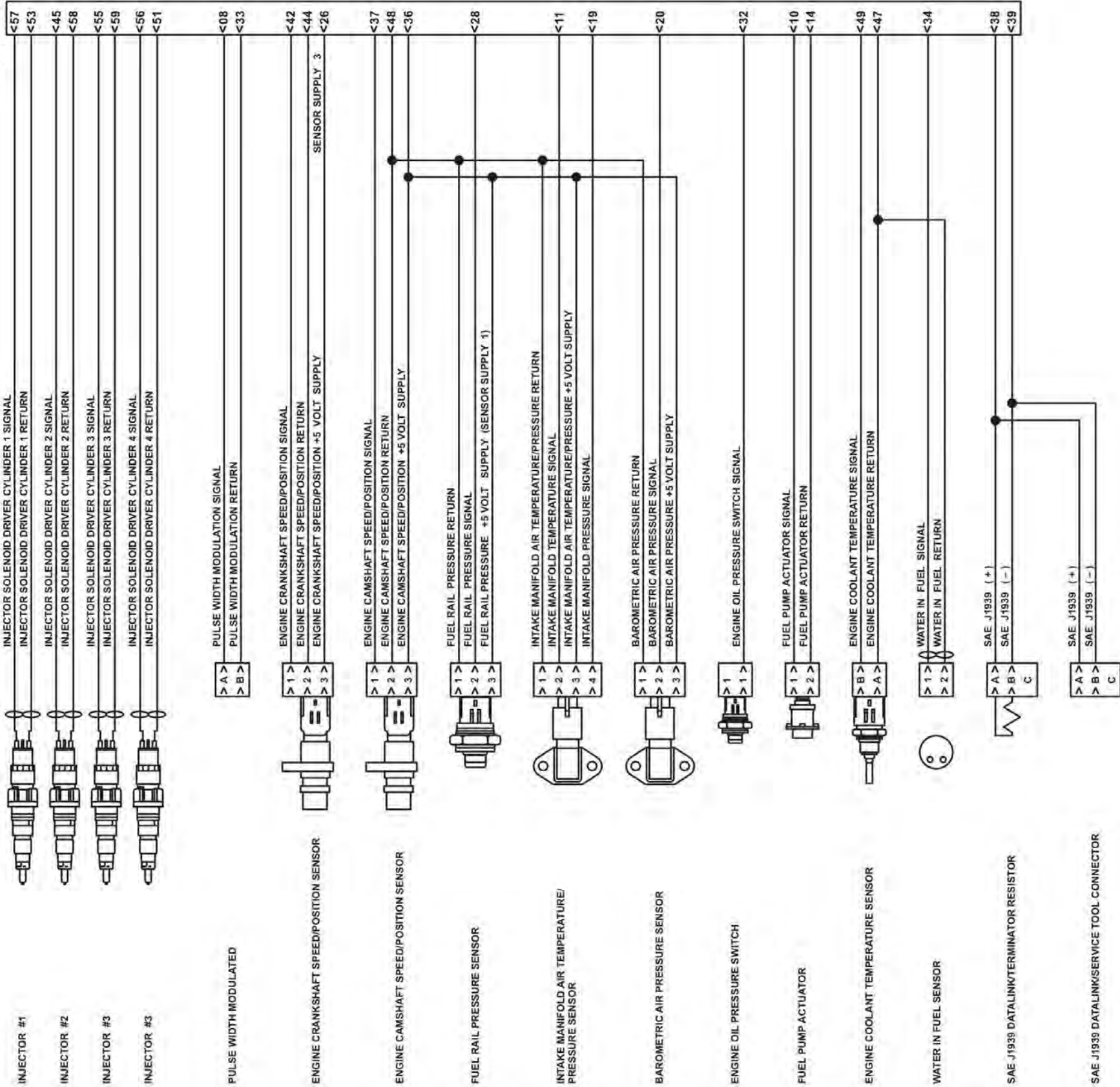






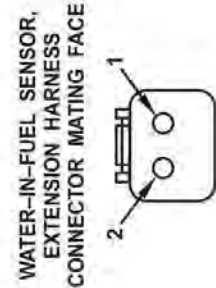
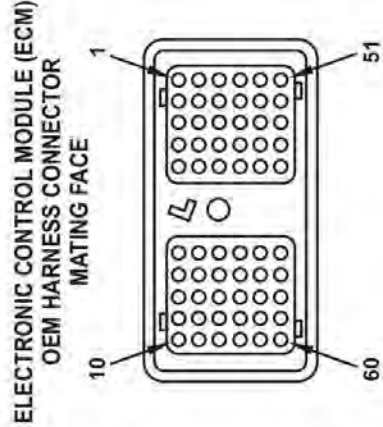
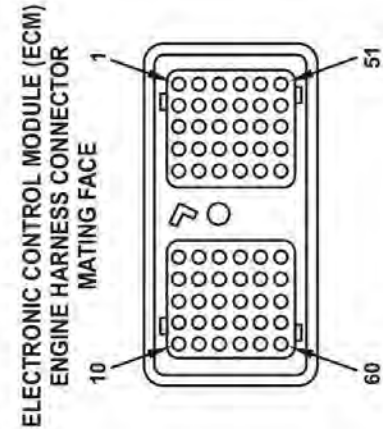
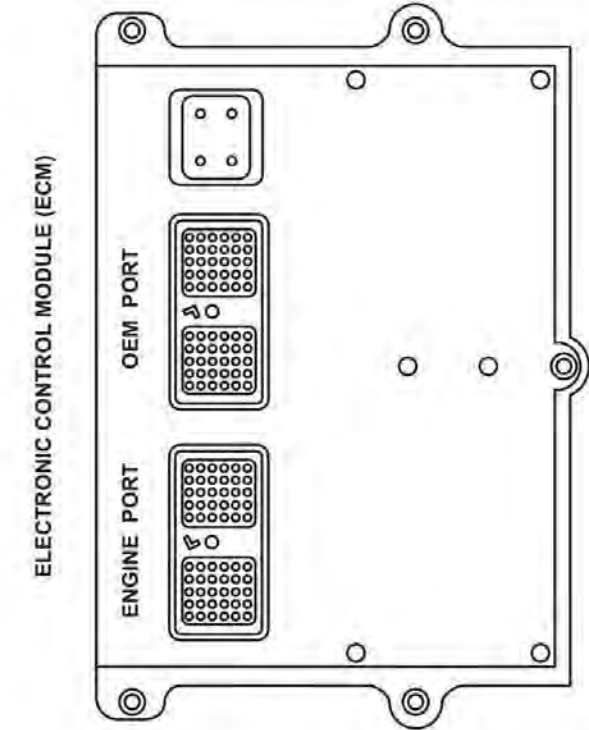
ELECTRONIC CONTROL MODULE (ECM)  
WIRING DIAGRAM

ECM 60-PIN  
ENGINE HARNESS  
CONNECTOR

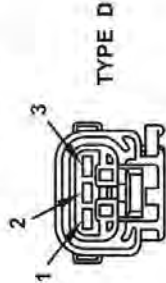




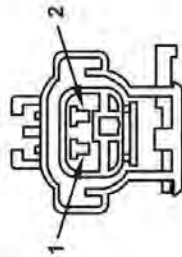
ELECTRONIC CONTROL MODULE (ECM)  
WIRING DIAGRAM



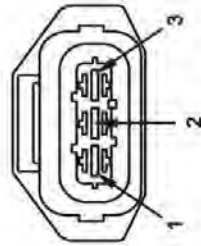
ENGINE CRANKSHAFT SPEED/POSITION SENSOR  
ENGINE CAMSHAFT SPEED/POSITION SENSOR  
CONNECTOR MATING FACE



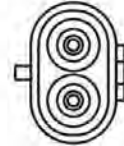
ENGINE OIL PRESSURE SWITCH  
CONNECTOR MATING FACE



FUEL RAIL  
PRESSURE SENSOR  
CONNECTOR MATING FACE



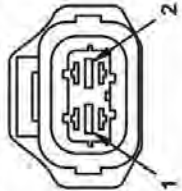
PULSE WIDTH  
MODULATED CONNECTOR  
MATING FACE



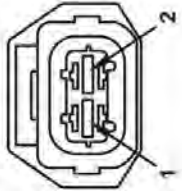
INTAKE MANIFOLD  
AIR TEMPERATURE & PRESSURE SENSOR  
CONNECTOR MATING FACE



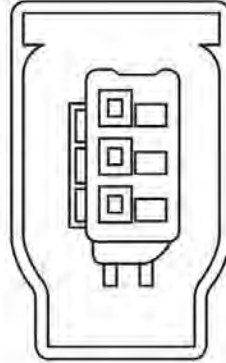
ENGINE COOLANT  
TEMPERATURE SENSOR  
CONNECTOR MATING FACE



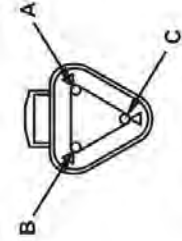
INJECTOR 1-4,  
FUEL PUMP ACTUATOR  
CONNECTOR MATING FACE



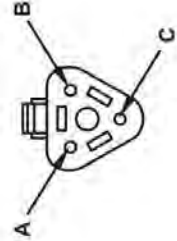
BAROMETRIC AIR PRESSURE  
SENSOR CONNECTOR MATING  
FACE



SAE J1939  
ENGINE DATALINK  
SERVICE CONNECTOR  
FUEL CONTROL MODULE SIDE



SAE J1939  
ENGINE DATALINK  
SERVICE CONNECTOR  
ENGINE CONTROL MODULE SIDE





## THE METRIC SYSTEM AND EQUIVALENTS

### LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches  
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches  
 1 Kilometer = 1000 Meters = 0.621 Miles

### WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces  
 1 Kilogram = 1000 Grams = 2.2 Lb.  
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

### LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces  
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

### SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches  
 1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet  
 1 Sq. Kilometer = 1,000 Sq. Meters = 0.386 Sq. Miles

### CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches  
 1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

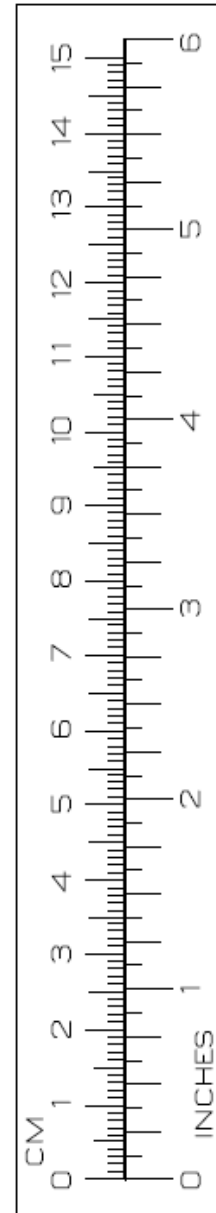
### TEMPERATURE

$5/9 (^{\circ}\text{F} - 32) = ^{\circ}\text{C}$   
 212° Fahrenheit is equivalent to 100° Celsius  
 90° Fahrenheit is equivalent to 32.2° Celsius  
 32° Fahrenheit is equivalent to 0° Celsius  
 $9/5 (^{\circ}\text{C} + 32) = ^{\circ}\text{F}$

### APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches .....	Centimeters .....	2.540
Feet .....	Meters .....	0.305
Yards .....	Meters .....	0.914
Miles .....	Kilometers .....	1.609
Square Inches .....	Square Centimeters .....	6.451
Square Feet .....	Square Meters .....	0.093
Square Yards .....	Square Meters .....	0.836
Square Miles .....	Square Kilometers .....	2.590
Acres .....	Square Hectometers .....	0.405
Cubic Feet .....	Cubic Meters .....	0.028
Cubic Yards .....	Cubic Meters .....	0.765
Fluid Ounces .....	Milliliters .....	29.573
Pints .....	Liters .....	0.473
Quarts .....	Liters .....	0.946
Gallons .....	Liters .....	3.785
Ounces .....	Grams .....	28.349
Pounds .....	Kilograms .....	0.454
Short Tons .....	Metric Tons .....	0.907
Pound-Feet .....	Newton-Meters .....	1.356
Pounds per Square Inch .....	Kilopascals .....	6.895
Miles per Gallon .....	Kilometers per Liter .....	0.425
Miles per Hour .....	Kilometers per Hour .....	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters .....	Inches .....	0.394
Meters .....	Feet .....	3.280
Meters .....	Yards .....	1.094
Kilometers .....	Miles .....	0.621
Square Centimeters .....	Square Inches .....	0.155
Square Meters .....	Square Feet .....	10.764
Square Meters .....	Square Yards .....	1.196
Square Kilometers .....	Square Miles .....	0.386
Square Hectometers .....	Acres .....	2.471
Cubic Meters .....	Cubic Feet .....	35.315
Cubic Meters .....	Cubic Yards .....	1.308
Milliliters .....	Fluid Ounces .....	0.034
Liters .....	Pints .....	2.113
Liters .....	Quarts .....	1.057
Liters .....	Gallons .....	0.264
Grams .....	Ounces .....	0.035
Kilograms .....	Pounds .....	2.205
Metric Tons .....	Short Tons .....	1.102
Newton-Meters .....	Pound-Feet .....	0.738
Kilopascals .....	Pounds per Square Inch .....	0.145
Kilometers per Liter .....	Miles per Gallon .....	2.354
Kilometers per Hour .....	Miles per Hour .....	0.621



**PIN: 086740-000**